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Exploring the potential for improving results of international knowledge exchange in the field of road transport

A project submitted to Middlesex
University in partial fulfilment of the
requirements for the degree of
Doctor of Professional Studies

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Disclaimer: The views expressed in this report are mine and are not necessarily the views of my adviser, examiners, or Middlesex University.

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Abstract

This research addresses the topic of knowledge exchange across borders in the field of road transport. Road transport administrations around the world learn from each other by taking part in various forms of knowledge exchanges. From my engagement and experiential learning in this area, I perceive a potential for attaining higher returns of such knowledge investments. The overall purpose of the project is to improve the results of international knowledge exchanges, while the aim is to explore the potential for making improvements in the knowledge exchange process. I have carried out the research mainly within my own organisation and explored the views and experience of participants in exchanges. The project draws on a review of theoretical and operational sources of knowledge and information. In the review, I deal with the research topic in three different contexts: theories and empirical studies, development cooperation, and the professional field.

The methodological approach is qualitative and inductive within the paradigm of constructivism. The primary method for data collection is individual semi-structured interviews with selected exchange participants. The interview data are analysed using thematic analysis. As a means of ensuring quality, the interview findings have been triangulated by focus groups and individual discussions. The validity and the reliability of the research are restricted, since it is context-bound and small-scale. However, discussions with professionals abroad indicate that the results apply more generally.

The findings show that there are constraining factors throughout the knowledge exchange process that prevent the participants and the organisation from taking full advantage of the exchanges. I have used the findings to construct a holistic, life cycle model that can make knowledge exchanges more effective. My model is unique of its kind and differs from existing models for acquiring, creating, and managing knowledge in organisations in that it is determined by the characteristics of my organisation and by a multinational knowledge exchange environment. In order to prepare the ground for its application, I have promoted the model both in my organisation and in the professional community abroad. The real value of the model can, however, only be demonstrated when it has been used for some time.

Glossary of terms and acronyms

Terms

Capacity: The ability of individuals and organisations to perform their responsibilities

Capacity development: The process whereby individuals and organisations strengthen, create, adapt, and maintain capacity

Digital native: A person born after the introduction of digital technologies (around 1985), and through interacting with digital technology from an early age, has a greater comfort level using it

Explicit knowledge: Knowledge that can be codified and written down to be shared, such as academic papers, books, reports, and data

Information and communication technologies (ICTs): An umbrella term that includes tools and resources used to communicate, and to create, disseminate, store, and manage information. Technologies include computers, the Internet, intranets, broadcasting technologies (radio and television), and telephony

Intermediate results: Results of the knowledge exchange process at the participant level that are intermediate to the organisation's knowledge exchange results

International forums: International professional associations, networks, and groups that exist to facilitate knowledge exchange between countries. Such forums can be multidisciplinary or specialised, and serve a global or regional audience

Knowledge: Information, facts, know-how, and experience

Knowledge exchange: The process whereby people and organisations are connected in order to learn from each other and strengthen their own capacity. Used here for exchange of knowledge between individuals and organisations from different countries

Knowledge exchange activities: Activities that take place within the various knowledge exchange methods. Such activities include discussions through face-to-face or virtual meetings and electronic communication, co-production of reports, field visits, giving presentations, listening to presentations, and reading

Knowledge exchange methods: Ways in which people exchange explicit and tacit knowledge. Knowledge exchange methods include methods such as staff exchanges, cooperation projects, committee work, working groups, study tours, conferences, seminars, and workshops

Knowledge exchange results: Results of the knowledge exchange process at the organisational level

Knowledge exchange partners: National organisations that take part in knowledge exchange with organisations in other countries

Knowledge sharing: The process whereby people and organisations are connected in order to learn from each other and strengthen their own capacity. Used here mainly for sharing of knowledge between individuals within an organisation

Multidirectional knowledge exchange: A process that allows a group of people to exchange knowledge through different activities that can occur in different sequences or simultaneously. In a multidirectional process, knowledge can flow in all directions. It allows participants to directly exchange their experience, practices, and tacit knowledge.

Tacit knowledge: Non-codified, unarticulated knowledge that is hard to formalise and communicate because it is rooted in experience, insight, and intuition, and thus can be best shared through personal experience

Unidirectional knowledge exchange: A process that allows knowledge to be passed in one direction. This usually involves explicit knowledge, such as lectures, presentations, and written materials

Acronyms

CSR	Corporate social responsibility
ICT	Information and communication technology
MBTI	Myers-Briggs Type Indicator
NVF	Nordic Road Association
OECD	Organisation for Economic Cooperation and Development
SECI	Socialisation, Externalisation, Combination, Internalisation

UN	United Nations
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
U.S.	United States of America
VARK	Visual, Aural, Read/write, and Kinesthetic sensory modalities
WRA	World Road Association

1. Introduction

This project has grown out of many years of international work experience in the road transport sector, and more specifically, my experiential learning in the area of knowledge exchange between national road transport organisations. Over the years, I have become attached to international cooperation, and I firmly believe in cooperation between nations as a means of learning from each other. In the road transport sector as in other sectors, people and countries depend on each other for development. Organisations in different countries work under different external and internal conditions, but ideas and solutions of others can be adapted to suit individual working environments. Exchange of knowledge can be a forceful tool for learning and developing capacities. The large number of organisations and professionals that take part in international knowledge exchanges demonstrates that knowledge from abroad is in demand. It is important to organise exchanges in effective ways that yield results.

This research builds on a project for which I have attained recognition and accreditation (DPS 5120). The report is found in appendix 1. The project deals with a strategic development process of the Nordic Road Association (NVF), which aimed at developing the association's strategy and operations. A core issue of the process was how to organise the exchange of knowledge among member organisations. My experience from the road transport sector at the national and international levels, which involves strategic development and management of projects and processes, enabled me to take the lead in the process and make progress in my professional practice. From this work, I gained valuable insights into the facilitation of knowledge exchanges of an international forum and experience with insider research.

I perceived a potential for getting more out of the learning and development opportunities that such knowledge exchanges offer. This perception has triggered a desire for exploring the potential for enhancing the results by changing or modifying the ways of engaging in knowledge exchange processes. While the NVF process focused on how an international forum can facilitate exchanges, it provided limited insights into the individual experience and views of participants in exchanges. Rather than studying the topic from the perspectives of an international forum, this research project deals with it from the perspectives of participants in exchanges.

At present, I am in charge of international activities of the Norwegian road administration, and I am engaged in the activities of international forums that facilitate exchanges between countries and in bilateral cooperation with national road transport administrations of other countries. I consider myself to be well placed as an insider to address this topic having extensive relevant experience, a broad professional network, and access to information and key actors in the professional community.

The research concerns primarily my own organisation, but also other national road transport administrations as well as international road-related forums. Inspired by my long-standing preoccupation about returns of the resource use in terms of increased capacity and improved performance, I have carried out this research with the intention of promoting changes in policies and practices. The overall purpose of the project is to improve the results of international knowledge exchange in the field of road transport. The defined aim, objectives, and outcome are as follows:

Aim

- Explore the potential for improvements in the process of international knowledge exchange in my organisation

Objectives

- Explore experience and views of participants in exchanges with regard to:
 - methods and activities for exchanging knowledge
 - impact of exchanges on participants and their organisation
 - problems and barriers in the process
 - changes or actions that can yield better results

Outcome

- A model for effective knowledge exchange between countries that can be used to guide policies and practices

The project is designed as a qualitative investigation involving interviews and focus group sessions with knowledge exchange participants of my organisation. I have also held focus group sessions and consultations with other colleagues in my organisation and with road transport professionals from abroad. The research further draws on a review of theoretical and operational sources of literature germane to the research topic.

The real value of a work-based research project lies in its practical implementation, and I have taken initiatives to prepare the ground for its application. With the view to know how the project will be received among the target audience and to achieve impact, I have shared research results at both the national and international levels. Making use of the proposed model involves changes in current policies and practices on international knowledge exchange. In my organisation, like in other organisations, it takes time to change customary ways of working, and the impact of the project may therefore not be felt or observed until some time after the publication of this report.

The report is structured as follows. The next chapter (chapter 2) provides the rationale and context of the project. In chapter 3, I present the review of relevant knowledge and information. Chapter 4 describes the research methodology and methods. In chapter 5, I present and discuss the research findings linking back to the literature review. The model for effective international knowledge exchange is presented in chapter 6. Finally, in chapter 7, I reflect on the professional and personal impact of the project.

2. Project rationale and context

This chapter explains the project's rationale and context. I first introduce the research topic and questions and my experience with the research topic. Then, I portray my personal perspectives and values that have given rise to the project idea. Lastly, I describe the organisational and professional setting and my views on the workplace-researcher role.

2.1 Research topic and questions

I have chosen the project title "Exploring the potential for improving results of international knowledge exchange in the field of road transport" that reflects the aim of the project.

National road transport administrations see knowledge exchange as a means to develop capacities in order to better perform their functions and deliver their services. While capacity can be defined as the ability of individuals and organisations to perform their responsibilities, capacity development can be defined as the process whereby individuals and organisations strengthen, create, adapt, and maintain capacity (OECD, 2015).

In the road transport sector, knowledge exchange across borders takes different forms. It can be formalised through bilateral agreements between national road transport administrations and through membership and participation in international forums that arrange for exchange of knowledge. It can also take more informal and ad hoc forms, such as going on study tours abroad and attending international conferences and similar one-time events.

National road transport administrations are government organisations or state agencies. Their mandate and areas of responsibilities vary from country to country, but their core responsibilities include planning, building, operating, and maintaining the nation's road network and providing for safe, reliable, and environmentally friendly transport for citizens and businesses. Road transport administrations do not operate in a competitive market, and the cooperation between such organisations is characterised by a relatively high degree of openness and easy flow of ideas and knowledge. The following example illustrates what impact knowledge exchange between countries can have.

In the field of road safety, Western countries have managed to reduce the number of road traffic fatalities significantly over the last 40-50 years. In Norway, the number of fatalities rose steadily until 1970. Since then, there has been a persistent positive trend. 560 fatalities were registered in 1970, but that figure dropped to below 150 by 2012. While the number of fatalities was reduced by two thirds, the traffic volume more than tripled. During the same period, the number of severely injured persons decreased from around 5200 to 650. Other countries have experience a similar trend. It is true to say that this positive development can largely be attributed to the exchange of experience, ideas, measures, and concerted efforts among nations. It should be stressed, however, that still far too many people die or are injured in traffic accidents, in particular in the developing world. (Source: Norwegian Public Roads Administration, 2013)

Box 1: An example of impact of knowledge exchange between countries

In knowledge exchanges, tacit knowledge has a key role. The many organisations from different countries that take part in international exchanges clearly show that managers and practitioners want more than explicit knowledge, such as reports, manuals, and other written materials. They also want to be connected to peers who face similar challenges in order to exchange tacit knowledge that resides in people's minds and learn from practical experience. Such interaction can enrich the understanding of own circumstances, opportunities, and constraints.

The term tacit knowledge was first introduced in science by Polanyi (1958 and 1966) who argued that this kind of knowledge forms part of scientific knowledge. It has since proved important to understand processes of transferring knowledge. As opposed to explicit knowledge, tacit knowledge is highly personal and hard to articulate and formalise. Subjective insights, intuitions, and feelings fall into this type of knowledge. It is deeply rooted in people's actions and experience as well as in their ideals, values, and emotions. While sharing of explicit knowledge is relatively straightforward, sharing of tacit knowledge occurs through different types of socialisation and requires personal contact and interaction.

The importance of tacit knowledge in organisations has received considerable attention in the last decades. According to Wellman (2009), around 80 percent of what an organisation knows can be characterised as tacit knowledge. Davenport and Prusak (2000) claim that workers are five times more likely to turn to a co-worker rather than to an explicit source of information. Yang (2004) posits that informal and spontaneous sharing of tacit knowledge

among employees can have a positive impact on organisational effectiveness. While tacit knowledge of employees is recognised as a crucial part of an organisation's knowledge, it is, in my experience, challenging to observe and manage tacit knowledge and to facilitate the interplay of tacit and explicit knowledge that is needed for the creation and management of organisational knowledge.

Inspired by my notion that there is a potential to gain more from taking part in knowledge exchange across nations, I have formulated the following main research question of the project:

- How to improve results of international knowledge exchanges in the field of road transport?

To support the main question, I have defined four specific questions related to participants' experience and views:

- What is the experience with various methods and activities used?
- What is the impact of the knowledge exchange on the participants and their organisation?
- What are the problems and barriers encountered?
- What changes or actions can yield better results?

With the aim to identify the potential for improvements in the process of international knowledge exchange in my organisation, I have carried out a qualitative investigation. To support my research, I have reviewed sources of knowledge and information germane to cross-border knowledge exchange.

2.2 Experience with the research topic

My interest in international knowledge exchange started some 10 years ago when I was seconded by my organisation as technical adviser to the World Road Association (WRA) secretariat. During this period, I was exposed to a variety of road-related areas that gave me better appreciation of the different areas and the need for international standards and coordination across the areas. Working in a multinational environment also provided the opportunity to better understand how different nationalities approach and prioritise various issues and how multicultural teams can work together effectively. The secondment to the WRA gave me new insights and learning and made me strongly believe that road

transport professionals worldwide have a great deal to learn from each other and that international forums play a very important role in this respect.

After my secondment, I have continued being involved in WRA activities. I have taken part in WRA committee work within strategic road transport planning. Working with specialists in this area from other countries was very inspiring and rewarding, and I could make use of the new knowledge and skills acquired to further develop my practice in my home country. This learning has been recognised and accredited (DPS 4040) as part of the doctoral programme.

My interest in cross-border knowledge exchange was further strengthened through a study I carried out on the issue of institutional capacity building in the context of the WRA's focus on developing countries. This work illustrates how international forums can support road transport development in developing countries and how these countries can benefit from being member of such forums. This learning has also been recognised and accredited (DPS 4060) as part of the doctoral programme.

My later involvement in the NVF has triggered an even deeper interest in international exchange of knowledge. As the incoming secretary general, I was responsible for managing a strategic development process of the association. The process addressed the important issue of how the NVF should facilitate knowledge exchange. This experience broadened my perspectives on international cooperation and the contributions of the NVF and other international forums in that regard. As already mentioned, I have attained recognition and accreditation (DPS 5120) for the learning from the NVF process.

In my current position, I coordinate international activities that involve bilateral contact and cooperation with road transport organisations in other countries and participation in international forums. At present, I am also secretary general of the NVF, member of governing bodies of the WRA, and member of the executive board of the Conference of European Directors of Roads.

2.3 Personal perspectives and values

My engagement in international work is largely based on my perspectives and values. The core values that I hold include justice, equal rights for all, respect, and dignity. Since I was young, I have had a global outlook on life, and I have always been curious about what exists outside my world and fascinated by other cultures. This curiosity has greatly influenced my

professional life, which I have directed towards international work. It is my intention to continue my career within international cooperation and gain more insights and experience in this field. I believe my professional outlook accords well with today's globalised world that requires and creates more international relations.

In my professional life, I have preferred roles and responsibilities that involve new thinking and development. I am concerned with setting strategic goals, improving work practices, and searching for alternative approaches. In my present job, I have initiated processes and actions leading to strategic and operational changes, and I have succeeded in developing both my area of responsibility and my own professional practice. From experiential learning and formal management training, I have gradually developed my skills to manage projects, processes, and people.

My personal perspectives and values are reflected in the ethical considerations of this project. There are ethical issues that relate to the purpose of the project and issues within the project that need to be taken into account (Costley et al., 2010). Ethical issues within the project concern the research process and the involvement of participants, and they are dealt with in chapter 4.

The ethics of the project's purpose involve social, economic, professional, and personal aspects. The purpose of the project is about enhancements, and the project is not intended to be detrimental to any individuals, groups, or organisations.

The values that guide my professional behaviour include honesty, integrity, and social responsibility. Corporate social responsibility (CSR) concerns the role of organisations as an integral part of the society, and this has ethical implications. Organisations do not only act in a market or in a sector, but also in a culture, in a society, and in a political system. CSR is about how institutions influence human beings, the environment, and the society. It refers to professionals and institutions voluntarily going beyond what the law requires to achieve social and environmental objectives in their activities. The European Commission (2015) defines CSR as the responsibility of enterprises for their impacts on society. To meet their social responsibility, enterprises should have in place a process to integrate social, environmental, ethical human rights, and consumer concerns into their business operations and core strategy in close collaboration with their stakeholders.

Road transport organisations are responsible for their impacts on society including the environment. They have a responsibility to provide efficient transport systems and services

and to solve transport challenges in ways that minimise or prevent negative impacts. Exchange of knowledge across countries can contribute to achievement of these objectives. This is a social and ethical dimension of knowledge exchange, and I will argue that road transport organisations around the world have a kind of social responsibility and moral obligation to support each other in developing the sector.

In the road transport sector, organisations spend considerable time and money in taking part in international knowledge exchanges. This investment needs to be justified in terms of increased capacities to perform their functions and responsibilities in their respective home environments. The question of justifying the resource use becomes particularly significant in times of economic recession and budgetary restraints. This makes it even more important for knowledge exchanges to be effective. The project will contribute to that end by exploring ways to improve the results.

When it comes to personal aspects, I regard myself as an ethically responsible person. According to Lunt (2008), ethically responsible professionals rarely refer directly to ethical codes, but act in a way that accords with and goes beyond them. While I acknowledge the need for ethical codes within organisations and professional bodies, I believe my behaviour and conduct are principally guided by my own professional and personal values. By way of example, I emphasise and promote international cooperation not only as a means to learn and develop capacities, but as a social responsibility and moral obligation too, although these aspects are not explicitly addressed by my organisation.

Undertaking this project has taken substantial time and efforts, and I have had to sacrifice other activities during the time it has taken to complete it. In view of the prospective learning outcomes and personal and professional development, I am, however, confident that the project is a worthwhile effort. It is my intention to continue being involved in international cooperation, and the project can pave the way for new work opportunities. I further see the project as a contribution to the professional community.

2.4 Organisational and professional setting

I have carried out the research mainly within the context of my workplace, and it has involved a number of employees of the organisation. As regards the participants, I do not have direct line management authority, but I have a long-standing working relationship with many of them.

The Benefits, Beneficiaries, Roles, Dependencies and Risks model (Costley et al., 2010) has been useful to guide the definition of project outcomes. The project's benefits are better results of the participation in cross-border knowledge exchange manifested in new policies and practices, if the model developed is applied. The beneficiaries are principally my organisation and its employees. The individual participant benefits from the project by being challenged to reflect on his/her experience, perceptions, and assumptions. In addition, I consider the project to have a place within other nations' road transport administrations, since the model is likely to be of relevance and can guide their policies and practices on international cooperation. International forums also have an interest in gaining insights into how their member organisations can profit more from their participation. For me as the researcher, the project is a useful learning and development process and serves to broaden and deepen my perspectives and insights on the research topic.

The project relates in particular to the current policy for international activities of my organisation that describes the grounds for the activities, what the activities consist of, and how the activities are organised and carried out (Norwegian Public Roads Administration, 2009). The policy states that international activities are based upon the organisation's vision, objective, and values. It further states that the organisation depends on exchange of knowledge with the outside world for its professional and organisational development.

As a workplace-researcher, I have a personal involvement and investment in the research, and the double role is complex and has both positive and negative implications. According to Gibbs (2007), insider-researchers, as opposed to outsider-researchers, have to live with the consequences of the research, and the role requires judgement, reflexivity, and criticality about relationships with others. Insider research involves a personal risk; if the role of the researcher extends beyond that which community members allows, membership may be lost and the researcher's status becomes that of an outsider, and the researcher may be seen to have betrayed his/her community. Costley et al. (2010) claim that insider-researchers need to have a particular sensitivity to colleagues, acknowledge the culture, and show respect for the values of the organisation.

In managing the dual role, I have been able to draw on my experience as an insider-researcher from the strategic development process of the NVF. In that case, the dual role was an issue of particular concern. As the next secretary general of the association, I had a particular stake in the results and responsibilities towards the members after completion. As the process manager, I needed to be careful in the way I influenced the process and the

others. The dual role required me to act both autonomously and collaboratively and respect my own and others' perspectives and standpoints. It was particularly challenging to deal with some of the NVF members who protected their spheres of work and felt somewhat threatened by the process. My key learning from the NVF process includes the need to communicate clearly the aim of the work and to balance my views and those of others.

Insider research is, according to Coghlan (2003), valuable because it draws on the experience of practitioners as complete members of their organisations and makes a distinctive contribution to the development of knowledge about organisations. Edwards (2002) states that the peculiar benefit of insider research is the knowledge the researcher brings concerning history and culture of the organisation. The knowledge of an insider-researcher carries with it a potential for deeper understanding and greater insights. Much of that knowledge may be undiscoverable by outsiders. My detailed knowledge of my organisation and workplace has certainly been an advantage when undertaking the research. I know well its areas of responsibility, organisational structure, culture, values, and position and role in the society. I have further benefitted from having easy access to the top management, line managers, and professionals who take part in knowledge exchanges. My international work experience in general, and especially the experience from international forums, has had an important positive influence on the project. This experience has not only given me insights into professional, cultural, and political aspects of such forums, but also a broad international professional network to draw on.

At the same time, being inside of the workplace and the professional community has certain negative implications. My managerial position, professional knowledge and experience, underlying personal assumptions, and biased perceptions have been challenging. At times, I have struggled to remain sufficiently distanced from viewpoints, attitudes, and perspectives of the project's participants. As stated by Coghlan (2003), insider-researchers need to learn how to look at the familiar from a fresh perspective and become open to discovering what they do not see and how their perspective is grounded in their functional role. This kind of insider, real-life research is not common in my workplace, and at the outset, I was afraid of being met with wariness and distrust and treated as an outsider. Edwards (2002) posits that rapport and trust should not be taken for granted given the role change. In a few occasions, people have expressed scepticism about my dual role. To avoid misperceptions and misunderstandings, I have endeavoured to communicate

clearly the purpose of the project and my role in it. Despite some occasional scepticism, I have not felt any kind of discomfort when undertaking the project.

My experience with insider research from the NVF process has been of great value in this project. It has not only served to avoid pitfalls, but to develop further my skills as insider-researcher too. In this project, I have emphasised clear communication regarding the aim of the project and my role as insider-researcher. I have also sought to be more open to new perspectives and more conscious about my relationships with the participants. It is my perception that I have been able to build trust among the participants and, at the same time, maintained my integrity as researcher. I have not met any specific cultural and political constraints in my workplace and professional community. On the contrary, I find that there is a general acceptance for new thinking. Ideas and proposals generated by the project concern both strategic and operational issues that will imply changes in current policies and practices if implemented. Introducing new approaches takes time, and there might be reactions from individuals as the project's outcome is likely to challenge assumptions and perceptions about international activities. It is my impression, however, that my research-informed model for making improvements will be generally accepted as a valuable and meaningful contribution.

3. Review of knowledge and information

I have carried out a review of knowledge and information with the purpose of providing a contextual framework for the research and discussing issues germane to the research topic that will support the discussion on my findings. Since the research is work-based geared towards combining theory and practice, I find it natural to include both theoretical and operational sources of literature.

3.1 Sources of literature

As shown in box 2, I have located the literature review in three different contexts: theories and empirical studies, development cooperation, and the professional field. Within each of these contexts, I have identified issues that I find most relevant to support my research.

Theories and empirical studies	Development cooperation	Professional field
<ul style="list-style-type: none">• Individual and collective learning• Innovation• Cross-cultural communication• Organisational learning and knowledge management	<ul style="list-style-type: none">• Approaches and modalities• Experience and lessons learned	<ul style="list-style-type: none">• Nature and extent of knowledge exchange• Knowledge exchange methods• Studies on knowledge exchange• Framework for knowledge exchange of my organisation

Box 2: Contexts and issues of literature review

The review starts with theoretical perspectives and empirical research. I have not found any academic literature that covers specifically the research topic. Despite the fact that public organisations are generally regarded as knowledge-based organisations, there exists little research related to the topic in the public sector. According to Rashman et al., (2009), a probable reason for this limited body of research could be the non-profit nature of the public sector that does not stimulate and motivate research.

Because of limited literature sources from the public sphere, most of my academic sources deal with business-oriented organisations. Traditionally, private companies see knowledge as a means of fostering innovation and gaining competitive advantages in the market. They are, however, increasingly concerned with ethical and ecological aspects in order to ensure a good reputation and a sustainable business. In contrast, public entities are driven by political goals and priorities, and they see knowledge as a means of delivering better public services and goods. Despite different drivers and goals, I find that there are aspects from the private sphere with relevance to the project.

The second part of the review contains a study of documents and other information sources of international development organisations, such as the Organisation for Economic Cooperation and Development (OECD), United Nations (UN) agencies, and the World Bank. Although these organisations focus on knowledge exchange within a development cooperation context, they share the aim of developing capacities through knowledge exchange, and there are similar approaches and modalities in use for exchanging knowledge.

In the third and last part of the review, I present information from the project's professional field. It includes information on the nature and extent of knowledge exchange, methods used, existing studies, and the current framework for knowledge exchange of my organisation. Important sources here are websites, corporate documents, and study reports.

The literature sources use the terms knowledge exchange and knowledge sharing interchangeably. To avoid possible confusion, I use, for the most part, *knowledge exchange* for exchange of knowledge between individuals and organisations from different countries and *knowledge sharing* for sharing of knowledge between individuals within an organisation.

3.2 Theoretical perspectives and empirical research

In this section, I deal with theoretical concepts and empirical studies in the fields of individual and collective learning, innovation, cross-cultural communication, and organisational learning and knowledge management. I have chosen to focus on these four issues because I believe they are essential to understand the processes of exchanging

knowledge and learning in multinational settings and of integrating and applying new knowledge in the home organisation of exchange participants.

3.2.1 Individual and collective learning

Various methods and activities are used in international knowledge exchanges, and participants are exposed to various learning environments where they learn both individually and collectively. It is, therefore, of interest to my research to look at existing models and concepts of individual and collective learning. Since the participants in this project are practicing professionals, I also touch on the issue of professional learning and development.

Individual learning styles is a complex and contentious issue, and different models have been developed to understand how individuals learn. The pioneering work of Kolb and Fry (1975) in developing an experiential learning model has formed the basis for further research and model development. Their model consists of four elements: concrete experience, observation of and reflection on that experience, formation of abstract concepts based upon the reflection, and testing of the new concepts. The four elements constitute a spiral of learning that usually starts with a concrete experience. In a later work, Kolb (1984) developed a model of individual learning styles that can be described using two continuums: active experimentation-reflective observation and abstract conceptualisation-concrete experience. The result is four types of learners: converger (active experimentation-abstract conceptualisation), accommodator (active experimentation-concrete experience), assimilator (reflective observation-abstract conceptualisation), and diverger (reflective observation-concrete experience).

Despite application of Kolb's model in many disciplines, professions, and organisational settings, it is disputed. According to Smith (2010), a major criticism is the promotion of solo and isolated learning rather than social learning. Another criticism is that the model does not sufficiently address the process of reflection on learning. In my understanding, the criticism regarding isolated learning is also true for other models of individual learning styles, such as the commonly used models of Honey and Mumford (1982) and VARK (2015). Honey and Mumford (1982) have adapted Kolb's model to accommodate managerial experiences of decision-making and problem solving. Their learning styles are named activist, reflector, theorist, and pragmatist. The VARK (2015) model, developed by Fleming in 1987, builds upon neuro-linguistic programming. According to this model, visual learners

learn best from seeing, auditory learners from listening, reading-writing learners from text, and tactile or kinesthetic learners from experience.

Participants in knowledge exchanges learn, for the most part, in social settings that encourage interactions and reflective dialogue with peers. In order to understand how they learn in such settings, I find it useful to look at models other than those that seek to explain individual learning styles only. In this respect, the widely used Myers-Briggs Type Indicator (MBTI, 2015) and the well-known learning pyramid developed by the National Training Laboratories in Bethel, Maine, U.S. are relevant models.

The Myers-Briggs Type Indicator is used to assess a person's entire personality, including learning style. It has been developed by Myers and Briggs building on Jung's theories of psychological types. In this context, the four function (core) pairs of the MBTI are especially relevant. The four function pairs are sensing-thinking, sensing-feeling, intuition-thinking, and intuition-feeling. The essence of the theory is that people differ in the way they prefer to use their perception and judgment. Perception involves ways of gathering information, and judgment involves ways of coming to conclusions about what has been perceived. Sensing and intuition are perceiving functions, while thinking and feeling are judging functions. In connection with my project, the MBTI function pairs can be useful to find out how the participants' preferences for knowledge exchange methods and activities reflect their personality and to understand how they act in knowledge exchanges.

As concerns the learning pyramid, it does not describe an individual learning process like the models presented above, but how individuals memorise. The pyramid simply illustrates the retention rate of various methods of learning. It shows that individuals retain only around 10 percent from reading. The rate increases to some 20 percent from seeing and to 30 percent from listening. When seeing and hearing are combined, the retention rate is about 50 percent. To increase the retention rate to higher levels, cooperation and practice are necessary. The highest retention rate is achieved from teaching others. In brief, the pyramid indicates that active participation results in higher retention, or in other words, individuals memorise better from active participation. It should be noted, however, that the pyramid is not scientifically documented. In my research, it is of interest to see how the participants' preferences for knowledge exchange methods and activities correspond with the learning pyramid.

While the above models deal with individual learning and memorising, knowledge exchanges also involve collective learning processes. Collective learning processes require

that individuals not only learn from each other, but also develop a shared understanding and meaning about the learning process and outcome (Garavan and McCarthy, 2008). According to the author, it can be challenging to create a framework within which individuals feel motivated and committed to collective learning and to facilitate the processes of creating, transferring, and implementing learning at the collective level.

There are two concepts of collective learning that have particular relevance to this project: team learning and communities of practice (networks). The first concept is a collective learning process in which a team is formed to carry out a project or solve a specific task. In knowledge exchanges, team learning takes place in two different settings. It occurs between participants from different countries when they form international groups. It also takes place between a group of colleagues from the same organisation when they take part in the same international group, study tour abroad, or international conference. While the purpose of the former case is to learn across countries, the purpose of the latter case is to enhance the learning within participating organisations.

Regarding the second concept, communities of practice, it has been promoted by Wenger (1998). A community of practice is a group of people who engage in a shared domain of practice and learn from each other as they interact regularly. A community of practice differs from a team in that it has no defined goals and exists as long as the members believe they have something to contribute to it, or gain from it. It is also necessary to distinguish between communities of practice and communities of interest. While communities of interest are communities where people simply share a common interest, communities of practice consist of people who interact with the intention of developing a practice. Compared to communities of interest, communities of practice require more commitment and engagement by its members in order to have impact on actual practice. They can be both formal and informal, and exist virtually or in real life, and they facilitate in particular the transfer of tacit knowledge among the members. In the context of my project, participants in exchanges usually build informal networks that act as communities of practice when they take part in a committee, working group, or project. In my experience, many participants find it useful to be part of networks of professionals from different countries in which they can exchange both tacit and explicit knowledge.

Regarding the issue of professional learning and development, it has been subject to considerable attention and research over the last decades. The need for continuing professional development to maintain high quality practice is widely identified as a

responsibility of professionals and organisations today. Research has led to a general understanding that practising professionals mainly learn from practice experience rather than from formal training courses and seminars, and that learning is ongoing through active engagement in practice. It is further widely accepted that critical reflection has the potential to shape learning (Webster-Wright, 2009). Learning at work is seen as both a cognitive and a social activity, and professionals do not only learn as individuals, but also from interactions with each other.

Boud and Hager (2012) advocate a practice approach to understand workplace learning, and they argue that professional development should be located in what professionals do and how they do it. According to the authors, learning is a normal part of working, and it occurs through practice in work settings from addressing challenges and problems that arise. Professionals progressively extend their existing capabilities and learn with and from each other. Learning can be regarded as an outcome of participating in practice. In order to develop work practices, reflective practices are required. Reflecting together on work issues can lead to collective learning and co-creation of knowledge that in turn can contribute to the development of not just the individuals concerned, but also the organisation itself.

Through participation in practice, professionals develop situated and empirical knowledge, which is tacit in nature and often referred to as professional knowing. According to Webster-Wright (2009), professionals develop professional knowing in different ways depending on the context of their practice and their understanding of that practice. Professional knowing is embodied, contextual, and embedded in practices, tools, equipment, etc., and it needs more than professional judgment to be applicable to others in different work settings. Many professional fields rely on evidence-based practice, and situated and empirical knowledge forms an important component of such practice. In order to become accepted as evidence-based practice, situated and empirical knowledge needs to be evaluated and validated according to established quality criteria.

In this section, I have discussed models and concepts of individual and collective learning, and the issue of professional learning and development. Individual learning in knowledge exchanges involves interactions and reflective dialogue, and I have pointed out that the MBTI is more suited to understand how participants act and learn in knowledge exchanges than models of learning styles that promote isolated learning. As concerns collective learning, I have highlighted the concepts of team learning and communities of practice and illustrated how they are applied in knowledge exchanges. In my research, I will disclose

what experience the participants have with various methods and activities, how they prefer to exchange knowledge, and how they view ways of taking part in knowledge exchanges. I will also look at the individual impact of exchanges and find out which changes can be made to improve the impact.

3.2.2 Innovation

Public organisations increasingly focus on innovation to address budgetary pressures and new societal demands (León et al., 2012; Gerson and Kitchen, 2014). The issue of innovation is germane to the research, since cross-border knowledge exchanges can provide an opportunity to learn about innovations of other countries and stimulate innovative thinking. In my opinion, dissemination of innovations and generation of new ideas depends largely on how knowledge exchanges are organised and how participants interact.

I find that the concept of open innovation promoted by Chesbrough (2003) is a kind of parallel to that of international knowledge exchange between organisations. The rationale behind both concepts is that organisations cannot rely only on their own resources and ideas in order to develop. As opposed to open innovation, closed innovation implies that organisations maintain control and ownership of the intellectual property and control of creation and management of ideas. In open innovation, organisations use both external and internal ideas in order to advance their processes, products, and services. When boundaries between organisations and their environment are more permeable, innovations can more easily flow inwards and outwards. In open innovation processes, boundary spanners play a key role in linking internal networks with external sources of information and ideas. Boundary spanning is not only important within disciplines, but across disciplines too, as this acts to form new connections and new ideas and knowledge. In knowledge exchanges, participants act as boundary spanners when they connect with professionals abroad from different disciplines and bring foreign ideas and knowledge into their home organisation.

Organisations apply various models and approaches to implement open innovation. A model that resembles the knowledge exchange process is the Want, Find, Get, Manage model developed by Slowinski and Sagal (2010). It implies asking first what an organisation wants (or needs) in order to meet its objectives. When the desired resources are not available internally, the organisation has to seek it elsewhere. The next phase is about how to find the needed resources and locate possible internal and external sources. At the end

of the find phase, the organisation has an overview of potential sources. The *want* phase and the *find* phase of the model accord with the identification of knowledge needs and suitable knowledge exchange forums/partners of a road transport administration. When the knowledge needed does not exist within the organisation or the country, it seeks to find it abroad. In the following *get* phase, the organisation has to determine which sources are the most promising. In knowledge exchanges, a road transport administration has to assess whether the foreign knowledge can be adapted to suit its needs and local environment. In the final *manage* phase, the organisation has to coordinate and integrate the resources acquired. A road transport administration has to ensure sharing of the foreign knowledge within the organisation, and, if adaptable and applicable, integration into its systems, policies, and practices.

Despite similarities with the knowledge exchange process, the Want, Find, Get, Manage model is designed for use in business environments, which are faced with other complicating factors than public road transport administrations. Among organisations that operate in a competitive market, there may be issues of power relationships, trust, protection or sharing of intellectual property rights, economic benefits, etc. that can hamper or prevent an open innovation process. In other words, companies cannot always get the resources they want, even if the resources exist. Conversely, there are no significant competitive conditions between road transport administrations in different countries, and in my experience, the relationship between them is marked by a high degree of openness and willingness to cooperate and exchange ideas and knowledge.

It is obvious that to foster innovation, the working environment needs to breed rather than squelch new ideas. According to Johnsen (2010), good ideas do not appear from eureka moments; they develop over time in people's minds as they stumble across related ideas of others. Johnsen (2010) has identified patterns that typify fertile environments for innovation, and I find that some of these patterns are worth considering in the facilitation of knowledge exchanges. These include liquid (or seamless) networks that allow new ideas to emerge through serendipitous connections formed between related ideas. People tend to get good ideas when they immerse in a network of new ideas. It is more important to allow the mind to move through multiple boxes than to simply think outside the box. Movement from box to box forces the mind to approach intellectual roadblocks from new angles, or to borrow tools from one discipline to solve problems in another. Innovation thrives when people can build on something without having to ask for permission, and the

use of open digital platforms like YouTube, Facebook, and Twitter can play a vital role in creating a breeding ground for innovation.

Road transport development is linked to the wider social development, and one cannot view road transport challenges in isolation. This is particularly the case in developing nations that face a range of social challenges, such as political stability, security, poverty, economic growth, health and education, etc. The interdependency calls for transdisciplinary approaches to solve road transport problems rather than single discipline approaches. Boundary spanning across related disciplines and thinking across multiple boxes are important for transdisciplinary thinking.

This section shows that there are similarities between the processes of open innovation and knowledge exchanges. In order to disseminate and generate innovative ideas through knowledge exchanges, it seems most effective to facilitate exchanges in ways that cut across discipline boundaries and expose participants to different environments. My research will identify which methods, activities, and environments encourage or discourage innovative thinking, and how dissemination of innovations and development of new ideas can be enhanced.

3.2.3 Cross-cultural communication

Participants in international knowledge exchanges interact and communicate with professionals from other countries who have different cultural background, values, and worldview. This can be challenging, since it requires sensitivity to other cultures and ability to adapt one's mode of communication. It is my experience that although people are aware of this challenge, they are not necessarily able to change their communication style. When participants in exchanges behave as they do with like-minded compatriots, it can constrain discussions and cause frustrations and misunderstandings.

Cross-cultural communication has emerged as a field of study in the wake of the growing globalisation. Traditionally, cross-cultural communication focuses on comparative differences and similarities between cultures. More emphasis is now being placed on cross-cultural interdependence, and the management of cross-cultural issues is increasingly seen as a form of knowledge management (Holden, 2002).

Culture can be described as a shared set of basic assumptions and values, with resultant behavioural norms, attitudes, and beliefs. It is essential to be aware that culture is learned.

Culture does not form part of the human nature, and it is distinct from individual personality. Although members of a society share culture, expressions of culture-related behaviour are modified by individual personality.

In order to communicate appropriately, one has to understand what communication involves. Adler (1991) describes communication as the exchange of meaning and includes behaviour that another person perceives and interprets. It is about exchanging both verbal messages (words) and non-verbal messages (tone of voice, facial expression, behaviour, and physical setting). People perceive things according to what they have been trained to do. Interests, values, and culture act as filters and lead people to distort, block, and create what they choose to see and hear. Interpretation is the process of making sense out of perceptions and organises the individuals' experience to guide their behaviour. Culture strongly influences interpretations. There are many sources of cross-cultural misinterpretation, such as subconscious cultural blinders, lack of cultural self-awareness, projected similarity, and parochialism.

According to Adler (1991), people tend to use their own culture as a standard of measurement, and since no cultures are identical, people often judge other cultures as inferior. In this regard, stereotypes come into play. While stereotypes are meant for describing cultural and behaviour norms of national and ethnic groups, they become counterproductive when people are placed in wrong groups, when group norms are incorrectly described, when the stereotype is confused with the description of a particular individual, and when the stereotype is not modified based on actual observations and experience. I believe it is crucial for exchange participants to be aware of these pitfalls in their interactions and communication with professionals abroad.

Lewis (2006) speaks of cross-cultural competence that is the ability to communicate effectively and appropriately with people of other cultures. Language proficiency is a basic requirement for being cross-culturally competent. It further requires knowledge about other cultures and other people's behaviours, but also self-awareness and knowledge of one's own culture. Knowledge about other cultures and one's own can reduce frustrations and enhance interactions and communication across borders. According to Lewis (2006), both training and international experience are necessary for developing competence and sensitivity in cross-cultural issues. In my experience, participants in exchanges often tend to ignore or pay too little attention to cultural issues regardless of international experience. In

that respect, I believe some kind of training can contribute to better cultural awareness and understanding and by that, better communication.

Within the field of cross-cultural communication, there exist some major works. Hall (1959 and 1969) identifies two dimensions of culture: high-context and low-context cultures, and polychronic and monochronic time orientation. High-context cultures assume that individuals are knowledgeable about the subject and need little background information. Low-context cultures assume that individuals know little about what they are told, and need much background information. Difficulties arise when people from high-context cultures communicate with people from low-context cultures. Hall's second concept, polychronic versus monochronic time orientation, deals with ways in which cultures structure their time. In cultures described as polychronic, people tend to manage more than one thing at a time rather than in a strict sequence as in monochronic cultures.

A cultural dimensions theory for cross-cultural communication developed by Hofstede (1980 and 1994) describes how a society's culture affects the values of its members, and how these values relate to behaviour. It describes six dimensions of cultures involving power distance, individualism versus collectivism, uncertainty avoidance, masculinity versus femininity, long-term versus short-term orientation, and indulgence versus restraint. Quantification of cultural dimensions enables cross-cultural comparisons between countries and regions.

Trompenaars and Hampden-Turner (1997) classify cultures along a mix of behavioural and value patterns. They identify seven value orientations that are almost similar to Hofstede's dimensions. The seven value dimensions comprise universalism versus particularism, communitarianism versus individualism, neutral versus emotional, diffuse versus specific cultures, achievement versus ascription, human-time relationship, and human-nature relationship.

A model of cross-cultural communication developed by Lewis (2006) classifies cultural norms into linear-active, multi-active, and re-active. Linear-active cultures are task-oriented and highly organised, multi-active cultures are people-oriented and loquacious, and re-active cultures are introverted and respect-oriented. In broad terms, countries in Northern Europe and North America are predominantly linear-active. Southern European, Latin, African, and Middle-Eastern countries tend to be multi-active, and countries in East Asia are more re-active. The linear-active and multi-active classification is similar to Hall's concept of monochronic and polychronic time orientation. The model stresses, however, that most

people are hybrid, though dominantly linear-active, multi-active, or re-active as a type. This is because a person is subject to a contextual influence involving his/her background of study, profession, and own personality preferences.

The above models present stereotypes on different nations' and groups' cultures, and they are intended to serve as guidelines for better understanding of cultural conditions at the societal level, not at the individual level. There exist, however, little empirical data on where countries are located in the various dimensions and classifications. In connection with this research, these models can contribute to better understanding of cultural differences and similarities at the national and societal levels, but they are of little value at the individual level. As emphasised above, culture is distinct from individual personality.

In this section, I have pointed out views and concepts that are essential to understand cross-cultural communication. It shows that to be able to interact and communicate appropriately, one has to distinguish between cultural background and individual personality, and avoid misusing stereotypes. Cross-cultural competence is needed, and it requires both training and international experience. In my research, I will find out to what extent participants in exchanges pay attention to cultural issues and which specific challenges they encounter in multicultural settings. I will further identify measures to improve communication across cultures.

3.2.4 Organisational learning and knowledge management

The preceding sections concern acquisition of new knowledge and ideas, and communication in multinational environments, while this section deals with sharing and application of new knowledge and ideas within organisations. I discuss conditions that influence knowledge sharing, and models and perspectives on organisational learning and knowledge management. It is obvious that sharing and utilisation of foreign knowledge are key factors for successful knowledge exchanges. In my experience, it takes considerable time and efforts to integrate the knowledge to achieve capacity development at the organisational level.

Organisational learning and knowledge management has been subject to considerable research, mostly in the private sector. According to Rashman et al. (2009), public organisations face different challenges than private companies when it comes to knowledge management. The public sector is different because it operates in a complex

political environment. Public organisations have to pursue multiple and often conflicting strategic objectives, and the complex organisational environment implies that there are many interacting aspects influencing the management of knowledge. I can easily recognise this situation from my experience in a public organisation. At the same time, I believe that factors such as choice of appropriate knowledge management strategies and managers' commitment to knowledge management have great impact on how well both public and private organisations manage their knowledge.

In the following, I will first look at sharing of knowledge in organisations. Most of the research that has been published on this issue focuses on large, commercial companies (Riege, 2005). The author argues that there are differences between private and public organisations, but there is no evidence of which factors are more dominant than others in the various environments. I therefore assume that studies dealing with business-oriented environments are relevant for public organisations and for this project.

Studies refer to both organisational and individual factors affecting knowledge sharing. Among organisational factors, the organisational environment is found to play a crucial role. An encouraging environment can have a direct influence on knowledge sharing behaviours according to Cabrera and Cabrera (2005). Several authors posit that particularly management involvement and support is critical (Cabrera et al., 2006; Rivera-Vazquez et al., 2009; McNichols, 2010; Amayah, 2013). Rewards and recognition are other influential organisational factors (Sandhu et al., 2011; Amayah, 2013).

Yu et al. (2003) argue that a cooperative environment encourages more knowledge sharing than a competitive one. This view is shared by Rashman et al. (2009) who state that the low level of competition in the public sector can facilitate sharing of knowledge. Conversely, it can be argued that little competition within organisations, being public or private, can lead to stagnation of ideas and practice and an unfounded belief that they perform well.

As regards organisational culture, McDermott and O'Dell (2001) argue that overcoming cultural barriers to sharing knowledge has more to do with the design and implementation of knowledge management efforts than with changing the culture. An interesting finding by these authors is that companies having knowledge sharing built into the culture did not change the culture to match knowledge sharing initiatives; they rather adapted the knowledge sharing to fit the culture.

Intra-organisational networking is another factor that has impact on knowledge sharing. Rolland and Kaminska-Labbé (2008) claim that networks have a positive influence on sharing of knowledge across organisational units and that knowledge cannot be coordinated in a top-down, centralised manner. According to Ardichvili et al. (2003), workers are motivated to become active members of a network when they view knowledge as meant for the public good, a moral obligation and/or a community interest.

In addition to organisational factors, there are individual factors that influence knowledge sharing in organisations. Several studies show that time constraints and attitudes are critical individual barriers (Yu et al., 2003; Riege, 2005; Sandhu et al., 2011). Yu et al. (2003) posit that individuals' attitudes towards sharing knowledge depend on factors such as trusting relationships, gaining respect, higher prestige and status, better self-image, improving chances for receiving knowledge in return, and growth in professional knowledge. Individuals are likely to form positive attitudes when they perceive these benefits as likely results of knowledge sharing. McNichols (2010) also finds that trusting relationships are essential.

Another individual factor affecting knowledge sharing is employees' perceptions of knowledge ownership (Saetang et al., 2010). Employees may assume that their knowledge belongs to them as individuals or to the employer. If they perceive organisational ownership of knowledge, they are more likely to share their knowledge than if they perceive individual ownership of knowledge. Perceptions of knowledge ownership are also connected to type of knowledge. While explicit knowledge is often viewed as organisational ownership and easy to share, tacit knowledge is more complicated. People are not fully aware of their tacit knowledge, since it is embedded in their practice and hard to articulate (Polanyi, 1966). Individuals may also believe that their tacit knowledge belongs to them, since it is embedded in their minds.

Concerning tools for knowledge sharing, it is clear that information and communication technologies (ICTs) have opened up many new opportunities. Tools, such as email, the Internet, intranets, social media, video conferencing etc. make it possible for employees to easily connect to one another and interact over a distance. An illustrative example in the context of this research is the use of Twitter and other social web tools at conferences. Twitter is ranked at the top among social web tools to disseminate information at conferences (Letierce et al., 2010). Studies show that use of Twitter adds scientific value to conferences and gets well integrated in the traditional ways of communicating (Ebner and

Reinhardt, 2009; Letierce et al., 2010). In addition to individuals who set up a Twitter account, conference organisers use Twitter to create a conference stream by setting up an official hashtag, so that anyone can add it into their tweets and share real-time information. Some conferences display the live stream of Twitter messages on their website. In this way, far more people can “attend” a conference, and conference attendees can virtually communicate with non-attending colleagues during the event.

While explicit knowledge is easy to share by use of ICTs, tacit knowledge sharing using ICTs is far more complicated. It is assumed that tacit knowledge sharing only can take place through social, face-to-face interactions over time. There is an ongoing discussion on the use of social web environments for tacit knowledge sharing (Panahi et al., 2013). It is argued that social web tools may create a great advantage for social interactions and increase the chance of tacit knowledge sharing because of their ease of use, informality, openness, multimedia-oriented and community-based features. According to the authors, however, there is still a lack of empirical studies supporting this argument. In this connection, one should remember that according to Polanyi (1966), we know more than we can tell. No social web tools can promote sharing of tacit knowledge that people find hard to articulate.

It is clear that ICTs can support employees in knowledge sharing, but many authors are critical to overreliance on technology. According to Davenport and Prusak (2000), ICTs do not promote knowledge sharing in an organisational culture that does not favour sharing of knowledge. Cabrera and Cabrera (2002) find that a social environment that encourages knowledge sharing is more important than ICTs. Newell et al. (2002) and von Krogh et al. (2006) argue that knowledge work depends primarily on behaviours, attitudes, and motivation of those who undertake and manage it and not on using ICTs. Smith (2001) states that one-of-a-kind, spontaneous, and creative conversations often occur when people share ideas and practicalities face-to-face in a free and open environment. In the discussion on ICTs, I think age comes into play. The new generation of digital natives is likely to rely more on ICTs for sharing purposes, and the use of suitable tools can stimulate more sharing. However, use of ICTs may lead to more superficial sharing that is less effective than smaller amounts of in-depth sharing.

When it comes to models and perspectives on organisational learning and knowledge management, I will look at a few that have particular relevance to the research. In the field of organisational learning, Senge (1990) introduced the notion of organisations as systems

and popularised the concept of the learning organisation. The author suggests five disciplines that make up organisational learning: personal mastery, mental models, shared vision, team learning, and systems thinking. Systems thinking is the fifth discipline that integrates the other four. As emphasised in section 3.2.1, team learning in organisations is especially imperative in knowledge exchanges.

Nonaka and Takeuchi (1995) have developed a well-known model to understand how organisations learn and create knowledge, namely the SECI model (Socialisation, Externalisation, Combination, Internalisation). It is a four-stage spiral model of alternating between tacit and explicit knowledge. The tacit knowledge of employees can be made explicit, codified in manuals, and incorporated into new products and processes. This process is called externalisation. The reverse process – from explicit to tacit – is called internalisation because it involves employees internalising an organisation's formal rules, procedures, and other forms of explicit knowledge. The term socialisation is used to denote the sharing of tacit knowledge, and the term combination to denote the dissemination of explicit knowledge. According to this model, knowledge creation and organisational learning take a path of socialisation, externalisation, combination, internalisation in an infinite spiral. In my opinion, this model appears somewhat theoretical as I do not believe that organisational knowledge is created in such a linear fashion. In addition, it does not take into account that tacit knowledge is hard to articulate, and some tacit knowledge of employees will remain tacit and never be shared and transformed into explicit knowledge.

The concept of knowledge conversion introduced by Nonaka and Takeuchi (1995) has been used by von Krogh et al. (2006) to show how firms can generate ideas and innovation. The authors propose a set of organisational activities (knowledge enablers) that promotes knowledge creation. There are five knowledge enablers: instil a knowledge vision, manage conversations, mobilise knowledge activists, create the right context for knowledge creation, and globalise local knowledge. This model promotes a social rather than a technological approach to knowledge management.

Chai (2010) suggests that organisations can choose to follow a codification or personalisation strategy for knowledge management, or a combination of both strategies. The codification strategy focuses on codifying knowledge and sharing the codified (explicit) knowledge through intranets and databases. The personalisation strategy, on the other hand, emphasises person-to-person interaction as a means of sharing both tacit and explicit knowledge. The author differentiates between reach and richness of mechanisms for

sharing knowledge. The choice of mechanism depends on its suitability for the stage of sharing (awareness or transfer) and the types of knowledge (explicit or tacit). Periodicals and reports are examples of mechanisms with high reach, since they can be reproduced in large quantities, circulated widely, and reach many individuals over a long period. Mechanisms with high reach are best suited for creating awareness of knowledge existence. Richness refers to the amount and the varieties of information that a mechanism can transfer at one time. Mechanisms involving face-to-face interaction have high richness, and they are more appropriate for transferring knowledge, particularly tacit knowledge. I believe few, if any, organisations apply only one of these strategies. They rather combine a codification strategy with high reach sharing mechanisms and a personalisation strategy with high richness mechanisms.

According to Wellman (2009), there are three different perspectives on knowledge management: the technology perspective, the organisational structure perspective, and the environmental perspective. The technology perspective favours the use of ICTs to enhance knowledge storage and sharing. This perspective corresponds to the codification strategy of Chai (2010). The organisational structure perspective asserts that the bureaucracy should accommodate the flow of knowledge from where it resides to where it is needed. The idea is that knowledge should flow by means of social interaction and administrative practices. In the environmental perspective, human behaviour and social norms determine how effectively an organisation manages knowledge. The personalisation strategy of Chai (2010) and the social approach of von Krogh et al. (2006) bear resemblance to the organisational structure and environmental perspectives.

This section illustrates that there are many organisational and individual enablers and barriers to knowledge sharing in organisations. As concerns individual factors, I believe they apply not only within organisations, but also when individuals from different organisations interact, such as in international knowledge exchanges. The models and perspectives presented promote different ways of learning and managing knowledge in organisations. My research will disclose the organisational impact of knowledge exchanges. More specifically, it will find out how participants in exchanges share knowledge acquired abroad with their colleagues and managers, which factors influence the sharing, and how more sharing can be achieved. It will further disclose how the organisation makes use of the foreign knowledge and how the utilisation can be improved.

3.3 Knowledge exchange in the context of development cooperation

Although this project is about cross-border knowledge exchange in the road transport sector, it is of relevance to study exchange of knowledge in the context of development cooperation. The aim of developing capacities is the same, and there are similar approaches and modalities in use. International development organisations hold substantial experience from implementing knowledge exchange programmes that is useful to draw on in my research. In this section, I will review approaches and modalities of knowledge exchange for development and some experience and lessons learned.

3.3.1 Approaches and modalities

Development cooperation has gone through a significant shift over the years. In the 1950s and 60s, common practice was to copy development models from capitalist countries or the Soviet Union with the risk of relying on their prescriptions and solutions without adaptation to the contexts and capacities of developing countries (OECD, 2011a). The development community has gradually recognised that the traditional way of transferring solutions from the North to the South is not effective. Today, the common understanding of what separates developed from less developed societies is not only disparities in resources, but also gaps in knowledge about how to use the resources (Stiglitz, 2002). The emphasis on knowledge as a key instrument for development is evident in the development community today. The report Knowledge for development: The state of the World Bank knowledge services (World Bank, 2011a) states that countries rate acquisition of knowledge as more valuable than financial lending. Exchange of knowledge has become a common approach to foster development.

Knowledge exchange aims at capacity development, and it is defined as a process that takes place at three equally important and interdependent levels (United Nations Committee of Experts on Public Administration, 2006):

- The individual level: Individuals with knowledge and skills are needed for organisations and societies to transform and grow. At the individual level, capacity development occurs through various processes of learning and knowledge acquisition and exchange.

- The institutional level: The exchange of skills, knowledge, and values among individuals belonging to a group or organisation translates, over time, into the institution's capacity, consisting of policies, systems, procedures, and culture.
- The societal level: Individuals and institutions drive the transformation that occurs at the societal level. In turn, the values and the governance system of a society influence the ability of individuals and institutions to develop further their capacity.

With regard to my project, this definition of capacity development appears appropriate, even though it focuses on capacity development at the individual (knowledge exchange participant) level and at the institutional (organisational) level.

For any exchange of knowledge to have impact, local contexts and capacities have to be taken into account. According to Stiglitz (2000), there are the two dimensions of knowledge – the general-local dimension and the explicit-tacit dimension – that have implications for the exchange of knowledge. While general knowledge is knowledge that holds across countries, cultures, and times, local knowledge takes account of the specifics of place, people, and time. Stiglitz (2000) argues that there is no such thing as diffusion of best practice; one has to scan globally for best practices, but test them locally, since local adaptation often amounts to reinventing the best practice in the new context. It is the local component of knowledge that has to be adapted. Knowledge must be made locally applicable, and local actors have to take care of the adaptation. Today, the “scan globally, reinvent locally” principle is acknowledged as a guiding principle among development actors.

Best practices may be in the form of practical know-how, or tacit knowledge, and international development organisations are in a good position to scan globally to identify best practices and play a brokering and matchmaking role to facilitate learning processes between countries. Such learning processes can involve study tours that allow people to see how it is done, cross-training where people are shown how to do it by those who have already done it, and twinning and secondment arrangements that pair together similar institutions.

Along with the rethinking of the traditional North-South cooperation there has been a shift towards knowledge exchange between developing countries, often termed South-South cooperation. An example of such South-South cooperation in the road transport sector is shown in box 3.

A delegation from the Lao government visited Ghana and Zambia in 1999 to learn from their successes in using sustainable financing mechanisms for road maintenance. Through the study tour, the delegation learned that road users are willing to pay for better road services and they should be represented in the road fund's board. This South-South knowledge exchange contributed to the Lao government's decision to create such a fund, which today covers the maintenance of the entire national road network and a part of the local road network. (Source: World Bank, 2011a)

Box 3: An example of South-South cooperation

Knowledge exchange is one of the nine pillars of the G20 Multi Year Action Plan on Development (OECD, 2011a). Within this context, development organisations are concerned with making current practices in knowledge exchange more effective, comparing modalities of different institutions, and fostering cooperation between national and international organisations with the view to scale up initiatives. They make efforts to take stock of best practices and find appropriate modalities to ensure that knowledge exchange translates into improved capacities. The World Bank (2011b), in particular, is concerned with improving brokering functions, strengthening the dissemination of best practices, and expanding funding options.

The OECD (2011a) states that good practice in knowledge exchange implies that activities should combine explicit and tacit knowledge, and peer-to-peer interaction is critical for tacit knowledge exchange. Knowledge exchange initiatives should feed into national plans and strategies to ensure follow-up and ownership, and the modalities used should ensure that knowledge gets to the end users. Knowledge seekers should be able to clearly identify and articulate their needs. This approach bears a similarity to the Want, Find, Get, Manage model outlined in section 3.2.2.

While access to tacit knowledge through face-to-face interactions is clearly in demand, knowledge acquisition and exchange has increasingly become more technology-mediated. When the World Bank launched its knowledge bank strategy in 1996, it began applying information technology to produce, disseminate, and manage knowledge (Stiglitz, 2000). The Global Development Network (GDN, 2015) was launched in 1999 as the first online knowledge exchange network. Today, almost all development organisations operate knowledge exchange platforms that allow users to swiftly obtain online information, support, and advice. The World Bank has an extensive online repository of information about knowledge exchange (World Bank, 2015). The UNDP has developed a Teamworks concept (UNDP, 2015) that enables online peer networking. Another platform is The South-

South Opportunity (2015), which is an online community consisting of professionals involved in South-South cooperation.

The Kronberg Declaration on the Future of Knowledge Acquisition and Sharing (UNESCO, 2007) recognises that the acquisition and exchange of knowledge have gone through dramatic changes because of rapidly emerging new ICTs and that the progress of ICTs can give rise to a general deliberation on access to knowledge in the future. More traditional knowledge exchange approaches can now be supported by online, just-in-time peer collaboration platforms. Despite new technological tools, the Kronberg Declaration acknowledges that face-to-face knowledge exchange will remain vital.

In connection with my research, it is worth noting the emphasis on combining non-codified practical experience (tacit knowledge) and codified (explicit) knowledge. In that respect, the World Bank (2013) distinguishes between different forms and delivery modes of knowledge exchanges, which I find to be applicable also in the field of road transport. The two main forms of knowledge exchange are unidirectional and multidirectional. Unidirectional knowledge exchange can be seen as a linear process, which allows knowledge to be passed in one direction. This usually involves explicit knowledge, such as presentations, lectures, and written materials. Multidirectional knowledge exchange, on the other hand, is a process that allows a group of participants to exchange knowledge through different activities, which are not linked in a linear fashion, but can occur in different sequences or simultaneously. In a multidirectional process, knowledge can flow in all directions. This allows participants to directly exchange their experience, practices, and tacit knowledge.

A delivery mode is the way in which participants interact with one another or with the learning content. The delivery mode is either synchronous (occurring at the same time) or asynchronous (occurring at different times). Synchronous knowledge exchange includes face-to-face, audio, online chat, and video conferencing. Asynchronous knowledge exchange includes e-learning, online discussion forums, online social networking, and email. By combining the two modes, participants are provided with greater flexibility in access and participation.

3.3.2 Experience and lessons learned

Among international development organisations, the World Bank has gathered most practical, first-hand experience from designing and implementing knowledge exchange

programmes. The experience of the World Bank (2011b) shows that knowledge exchange is most of all about people, not about formalised systems or technologies. Knowledge exchange occurs when people interact with each other. The context is also crucial. An approach or a solution that works in one context will not necessarily transfer well into another. Successful knowledge exchanges involve extended learning processes, rather than simple communication as the knowledge that is exchanged needs to be internalised and adapted to the local context and needs. Approaches to knowledge exchange that rely only on codified knowledge stored in databases that operate on a pull basis, have proved to be less effective.

Experience shows that knowledge exchanges in development cooperation are faced with challenges related to the nature of knowledge (Denning, 2002). There are some lessons learned that I find to be of interest to my project. People only reveal what they know to people they trust. If one scans for knowledge globally, one also needs to pay close attention to the local context of the origin of the knowledge. If one knows who knows something, and one knows that person, then there is a possibility of acquiring more knowledge. Most of what people think they know has been learned by talking things through with other people or working together in shared problem solving. Where timeframes are short, all that can be transferred is explicit knowledge. The deeper tacit knowledge takes more time and more social context. Tacit understanding cannot be easily transferred; it must be acquired afresh or rediscovered by each new person. The acquisition of tacit know-how is most likely to take place in apprenticeships, study tours, twinning arrangements, secondments, and settings where people can informally exchange knowledge. Access only to information without knowledge of the local context is of little use as the context in which knowledge arises is often crucial to understand and exploit it.

According to Denning (2002), most learning occurs in informal settings rather than in formal training programmes. The major benefit from formal training programmes is the possibility to connect and form networks with other people. With the recognition that most learning is informal, knowledge exchange networks (communities of practice) have emerged as an effective organising concept. Knowledge networks have proved to be particularly suitable for the exchange of tacit knowledge. The effectiveness of networks comes from the fact that when they function well, they provide knowledge “just in time” and “just enough.” A network comes into operation when a member of the network identifies a real-life problem, and the other members only contribute if they have useful expertise in the particular problem.

As expressed in section 3.2.1, networks of road transport professionals from different countries are, in my experience, an effective way of exchanging both tacit and explicit knowledge. Fukuda-Parr and Hill (2002) have identified certain conditions for effective networks, which have relevance for my project: The better defined a network is, and the more focused it is on a specific issue, the more useful the knowledge exchange will be. The higher the level of trust is within the network, the greater the volume and honesty of knowledge flows. Face-to-face meetings and small networks facilitate trust between members of the network. Networks should be developed from the bottom up and follow their own agenda in such a way that the needs of the members are met.

The World Bank (2011b) is concerned with designing and implementing knowledge exchange programmes with a results framework in mind. It is found that few knowledge exchange programmes track and evaluate systematically the results achieved in terms of capacity development and development impact. More result-oriented design and implementation will provide more opportunities to scale up activities on an informed basis. Most initiatives use a mix of one-time and process-based methods. However, even the best methods show difficulties to promote a longer-term cooperation among practitioners because the returns are often not clear for end users of the knowledge exchange.

In a joint study, the Korea Development Institute and the World Bank (2011) have analysed the effectiveness of South-South knowledge exchange programmes with the view of gathering lessons that can inform global practice. The results of this study highlight lessons for the design and management of knowledge exchange programmes for future replication or improvement. The study identifies some lessons that are germane to my research, namely that programmes should respond to the knowledge needs of the partners involved, involve participants who have relevant experience and are in key positions to effect changes, and promote and sustain peer-to-peer interactions in order to facilitate the exchange of tacit knowledge.

Based on lessons learned and good practices, the World Bank (2013 and 2014) has developed a guide on how to plan and implement knowledge exchange programmes to support development initiatives and policy reforms at the national (societal) level. The guide explains six elements of the knowledge exchange that are required for success. These elements involve defining goals, identifying appropriate knowledge exchange partners, financing knowledge exchange, designing knowledge exchange, implementing knowledge exchange, and collecting lessons learned and sharing results. This guide seems useful to my

project, even though it deals with knowledge exchange at the national (societal) level and with financing mechanisms, which are not especially important in the context of this project.

In summary, the experience from development cooperation indicates that tacit knowledge plays a key role in knowledge exchanges, and that networks can be effective for exchange of knowledge, in particular tacit knowledge. Another lesson learned is the need for extended learning processes so that new knowledge can be adapted to the local context and needs. Knowledge exchanges should further respond to identified needs of the partners involved and be results-focused in order to make the returns clear to the end users. It is also imperative to involve experienced and influential participants. In my research, I will draw on these lessons learned, in particular when exploring the participants' experience with various methods and activities. I will also look at the aspects of participant selection, needs identification, and results orientation, and identify possible measures of improvement.

3.4 International knowledge exchange in the field of road transport

This part of the review deals with cross-border knowledge exchange in the professional field. It contains information on the nature and extent of knowledge exchange, methods used, existing studies related to knowledge exchange and international cooperation, and the current framework for knowledge exchange of my organisation. These issues serve as important information sources to my research.

3.4.1 Nature and extent of knowledge exchange

Nearly all road transport administrations around the world are involved in knowledge exchange with other countries in one way or the other. While the nature and extent of the engagement varies according to their needs, priorities, and financial ability, they share the primary goal of developing individual and organisational capacity. In my experience, the international engagement can also be driven by social and ethical factors, such as social responsibility and international solidarity. Many countries recognise the social value of being part of the international professional community in order to support other countries in their efforts to develop the road transport sector. Additionally, international cooperation

can provide economic and political benefits at the national level. It can lead to future business opportunities and new relationships with other countries, complementing trade and political dialogue.

In the road transport sector, there are two main approaches to exchanging knowledge: participation in international forums and bilateral cooperation with other countries. Participation in international forums usually constitutes a major component of the organisations' international activities. There exists a range of international forums that arrange for knowledge exchange between national organisations. An overview provided by the World Road Association (2015) shows that there are some twenty international road-related forums, which can be divided into four groups as follows: regional specialised forums, regional multidisciplinary forums, global specialised forums, and global multidisciplinary forums.

While specialised forums aim at development of their particular field, multidisciplinary forums have a more holistic approach aiming at development of the sector as a whole. The international forums offer various methods and services depending on their goals, member groups, administrative capacity, financial means, etc. Appendix 2 presents an overview of such forums and the kind and range of knowledge exchange methods and services they provide. The appendix also includes examples of goals of international forums.

In this connection, it is worth noting that the strategic development process of the NVF (appendix 1) did not result in any changes in the kind and range of knowledge exchange methods and services. Most members of the association advocated committee work and seminars as the preferred methods. While such resistance to changes can be regarded as an expression of satisfaction, it can also have to do with traditional ways of thinking and lack of awareness or appreciation of alternative approaches to exchanging knowledge.

3.4.2 Knowledge exchange methods

National road transport administrations tend to apply similar methods of knowledge exchange. They typically engage in one-off methods, such as conferences and study tours, and in more long-term, process-based methods, such as committee work, working groups, and cooperation projects organised by international forums, and staff exchanges with other national administrations. All long-term methods facilitate exchange of both explicit and tacit knowledge. While conferences mainly allow for exchange of explicit knowledge, study

tours also allow for exchange of tacit knowledge depending on the level of interaction. In the following, I describe the characteristics of the most common methods and of one unique method, and I provide information on other services of international forums.

Most commonly used methods

Conferences (including congresses, symposiums, seminars, and workshops)

This is one of the most frequently used methods. All international forums hold conferences and similar events either regularly or ad hoc. Such events reach large audiences, and they are well suited to get a state-of-the-art overview and to learn what knowledge exists and about new concepts. Depending on their structure, they may include several activities, such as panel discussions, plenary and parallel sessions, workshops, and field visits.

Study tours

National road transport administrations usually organise study tours on a bilateral basis. A study tour in this connection is a visit by an individual or group to one or more countries. Study tours provide an opportunity to learn about technologies, methods, and practices abroad. They allow for a high level of interaction among participants and exposure to the topic of study, and an opportunity to see how things work in practice.

Committees, working groups, and cooperation projects

Around half of the international forums organise committees, working groups, and cooperation projects. Such groups of professionals are set up within a designated area of work with the aim to allow for participant-driven knowledge exchange over a given period. The success depends on the participants' commitment for mutual learning and on dedicated people to manage and encourage group interaction. The strengths of committees, working groups, and cooperation projects are in-depth, face-to-face or virtual exchanges among peers, continuous learning, and network-building.

Staff exchanges

Staff exchanges are organised, for the most part, on a bilateral basis between national road transport administrations. Staff exchanges are usually long-lasting, and they require more resources compared with other methods. They provide for in-depth, face-to-face exchanges among peers, continuous learning, and network-building.

The International Highway Technology Scanning Programme of the U.S.

The International Highway Technology Scanning Programme of the U.S. (Federal Highway Administration, 2015) appears to be unique among its kind. The programme is currently put on hold. The programme has aimed at accessing and evaluating innovative technologies and practices in other countries that could benefit the U.S. highway transport systems and services. Since the programme's inception in 1991, over 80 scans have been conducted covering a range of topics. The programme is reported to have resulted in significant improvements and savings in technologies and practices throughout the U.S.

The scan teams, consisting of some ten members, visited several countries over a two-week period. Scan team members have not been selected solely based on their expertise, but also on their assumed ability to inform their peers and the domestic highway community of what they have learned and to catalyse the implementation of new technology. The programme has had a strong focus on implementation and results. Once a scan was completed, team members evaluated findings and developed comprehensive reports, including recommendations for further research and pilot projects to verify the value of adapting innovations for application in the U.S. Scan reports and results of pilot projects and research were circulated to state and local transport officials and the private sector throughout the U.S. The programme has supported scan teams with both implementation expertise and funding.

Other services of international forums

International forums provide other services than the most common knowledge exchange methods described above. Most forums issue publications in the forms of technical reports, standards, manuals, guides, and journals. Some forums have an online bookstore. It is very common among the forums to issue a periodical e-newsletter. By providing knowledge and information in such written forms, the forums document their activities, promote the collective expertise of their membership, and reach a wider audience.

With regard to ICTs, international forums usually operate a dynamic website that serves as a virtual home. The website provides easy access to corporate and technical documents, news, events, calendars, and virtual libraries. As the website is both an internal and external means of communication, it is common to share internal information on an extranet accessible by members only. While it has become essential for the forums to have a dynamic website, the use of social media, such as Twitter, LinkedIn, and Facebook, and

web based and video communication technology is still limited, but increasing. Some forums offer training courses and training materials for professionals, and a few forums provide educational programmes and resources for students. The use of e-learning, online learning, web based training courses is limited.

In my research, I will identify participants' views and experience concerning knowledge exchange methods, and if there are improvements to be made with regard to choice of methods and international forums/partners.

3.4.3 Studies on knowledge exchange

It is of interest to see how the findings of existing studies on international cooperation and exchange of knowledge in the professional field correspond to the findings of my project. Unfortunately, very few such studies have been carried out. The Transportation Research Center (1992) has prepared a report from international seminars on technology transfer and adaptability. The report points out a number of social, economic, institutional, and political barriers to international transfer of technologies and knowledge. A study by the Transportation Research Board (1995) deals with the state of practice in the U.S. with respect to use of foreign transportation technologies and methods. It looks at the effectiveness at the various stages of the technology transfer process: identification, introduction, and implementation. The study identifies institutional and cultural factors that affect implementation.

A more recent survey by the World Road Association (2014) among 460 young professionals in 36 different countries gives some interesting insights. The survey's target group consists of professionals below the age of 45 years. Most respondents work for government organisations. The survey shows that the website is the most used service, followed by technical reports, professional magazines, and international events. A trend across age groups is that the use of services increases with age. The oldest age segment is the most frequent users of services. The respondents are most interested in information on best practices, case studies, latest technologies, international standards, research papers, and technical reports. There is a relatively high interest for participating in activities such as online discussions with peers and in webinars. More than 80 percent of the respondents believe that participation will contribute to expanding their professional knowledge base, while some 40 percent think it will contribute to better job performance and to career advancement.

It is further of interest in my research to look at a study outside of the road transport sector. Salskov-Iversen (2006) has reviewed international activities of Danish local governments focusing on the perceived relevance of such activities for public sector learning. The findings show that around one third of the local authorities consider themselves internationally active, but do not consider international cooperation to be of very practical significance for the day-to-day business. International activities appear to be an under-utilised learning resource. Organisational development and learning is more emphasised as incentives for internationalisation than as drivers. However, international activities are found to be important for recruiting and retaining employees and for developing their skills. Young people tend to be more appreciative of the organisational and individual learning perspectives. Local authorities do not, however, actively promote their international engagement in fear of being accused of wasting taxpayers' money.

3.4.4 Framework for knowledge exchange of my organisation

In this section, I outline the existing framework for knowledge exchange of my organisation, which is an essential source of reference in my research. According to its policy (Norwegian Public Roads Administration, 2009), international activities should be connected to domestic work within the framework provided by national transport plans and other governing documents. They should be included in annual work plans, budgets, and annual performance agreements. International activities are included in the quality system of the organisation that describes the process of all main tasks. The quality system forms part of the management system, and it aims to ensure quality and efficiency in the way tasks are performed.

The policy for international activities emphasises that these activities should be needs-based and goal-oriented, and develop individual and organisational capacity. Taking part in international forums that facilitate exchange of knowledge constitutes the major share of the organisation's international cooperation. The organisation is a member of both multidisciplinary and specialised forums. Knowledge exchange through bilateral cooperation with organisations abroad takes place on a modest scale. Participants in international forums and bilateral cooperation are appointed according to competence requirements. Participants should be highly knowledgeable, possess good English skills, and act as good representatives of the employer.

The multidisciplinary forums usually work in four-year cycles, and admission of members to these forums takes place every four years. The management decides in which committees, working groups, and cooperation projects to participate based on an assessment of areas of work that need to be further developed. The respective responsible units appoint employees to the selected committees, groups, and projects. When it comes to the specialised forums, each responsible unit decides which forums are appropriate and appoints employees to these forums. The participants in international forums should hold regular internal meetings in which they can share information and experience among themselves. In most cases, only one employee takes part in an international committee, group, or project.

When it comes to international conferences and study tours, the participation is coordinated by the management. Any employee can apply for attending conferences and going on study tours. The organisation usually sends small groups of employees to conferences and on study tours in order to enhance the benefits and outcomes.

All participants in international activities are required to share knowledge acquired abroad within the organisation and the professional community. A written report is required only from study tours. Managers, on their side, have the responsibility to ensure and facilitate the sharing of knowledge. While knowledge sharing is required according to the organisation's policy, it is not known to what extent sharing actually takes place, since there is no systematic follow-up of sharing activities.

The current policy for international activities sets out some general guidelines and requirements for partaking in cross-border knowledge exchange, but it does not provide detailed descriptions of the various elements. My research will show how the views and experience of participants in knowledge exchanges relate to the stated policy as concerns the intended individual and organisational capacity development.

3.5 Summing up of the review

As stated in the introduction to this chapter, the purpose of the review is to provide a contextual framework for the research and discuss issues related to the research topic that will support the discussion on my findings. I have included both theoretical and operational sources of literature and dealt with the research topic in three different contexts: theories and empirical studies, development cooperation, and the professional field. This

exploration of existing knowledge and information has greatly expanded my thinking of the research topic and enabled me to approach the research with a broader perspective.

The review of *theories and empirical studies* includes issues of particular importance to the process of international knowledge exchange. The issue of *individual and collective learning* will support my research when it comes to the participants' experience and preferences concerning knowledge exchange methods and activities, their views on ways of taking part in knowledge exchanges, and also the individual impact of exchanges and changes that can be made to improve the impact. In the field of *innovation*, I will draw on the literature sources as concerns which methods, activities, and environments encourage or discourage innovative thinking, and how dissemination of innovations and development of new ideas can be enhanced. Concerning the issue of *cross-cultural communication*, it will support my identification of challenges that participants encounter in multicultural settings, the extent to what they pay attention to cultural issues, and measures that can improve communication across cultures. The issue of *organisational learning and knowledge management* will support my research with regard to identifying the organisational impact of knowledge exchanges. In this respect, I will employ literature sources as concerns sharing of knowledge from abroad within the home organisation, factors that influence the sharing, measures to increase the sharing, how the organisation makes use of the foreign knowledge, and how the utilisation can be improved.

The review of *knowledge exchange within development cooperation* provides information on approaches and modalities used for knowledge exchanges, and some experience and lessons learned. I will make use of this information in my exploration of the participants' experience with various methods and activities, and of improvement measures in the design of knowledge exchange initiatives.

The last part of the review gives information on *knowledge exchange in the road transport sector* as regards the nature and extent of knowledge exchange, methods used, existing studies, and the framework for knowledge exchange of my organisation. These sources of information will be useful in my exploration of the participants' views and experience as concerns choice of methods/activities and partners/international forums of knowledge exchange initiatives, and measures of improvements. It is of particular interest to find out to what extent the intended capacity development at the individual and the organisational levels is achieved.

4. Research methodology and methods

In this chapter, I discuss my personal perspective and how it shapes my methodological orientation. The research approach and data collection and analysis adopted in the study are described. I also assess ethical issues within the project along with quality aspects of the research. I have intended to design the project in a way that is fit for purpose, workable, coherent with my personal perspective, and consistent with the project's context and what it aims to achieve.

4.1 Methodological approach

The choice of research approach is guided by my personal perspective and worldview. My educational background is within natural science, but my work experience has gradually changed my professional identity and orientation towards social science. In science, there exist various paradigms for research. A paradigm can be defined as a set of assumptions about the nature of reality, the status of human knowledge, and the kinds of methods that can be applied to answer research questions.

There are different approaches to describing paradigms. Guba and Lincoln (2005) describe five major research paradigms – positivism, post-positivism, critical theory, participatory paradigms, and constructivism. Burrell and Morgan (1985) group social science approaches into four paradigms according to their view of knowledge (subjective to objective) and their view of society (describing status quo or creating change). Another way of looking at paradigms is developed by Arbnor and Bjerke (2009) who have created a bridge between the pragmatic approach to frames of reference and the more traditional view of paradigms. They place paradigms on a scale from objectivist to subjectivist and propose three approaches – the analytical, systems, and actors approach – that draw on different paradigms.

My project is a work-based and transdisciplinary piece of research. Transdisciplinary ways of thinking tend to begin with practical issues in context rather than starting from a disciplinary standpoint. This favours pragmatic paradigms that are not primarily concerned with issues of reality or theories, but focus on what works and what is appropriate in a particular context. In my worldview, I recognise positivism and post-positivism as a way of understanding a reality that can be regarded as external to human beings. These are

paradigms that treat reality as objective and seek to find hard facts from an external objective world. My research is, however, principally guided by the belief that individuals are influenced by the environments and cultural background, and that we perceive and interpret the reality in different ways. With this perspective, reality can be regarded as social constructs rather than as objective truths.

My outlook and perspective lean towards constructivism, and I have placed my research within that paradigm. Constructivism as described by Guba and Lincoln (2005) implies that meaning and truth do not exist in an external world; they are created by people's interaction with the world. Meaning is constructed rather than discovered, so human beings construct their own meaning in different ways and to the same phenomenon. Constructivism regards reality as being individually and socially derived and knowledge not as absolute but as an individual construction. In constructivist research, the researcher is generally regarded as part of the research as an involved participant (insider) who seeks to give voice to the experience, views, and perceptions of the other participants. Constructivist research is geared towards achieving reflections of the participants' subjective reality. It follows that my research approach is inductive. As opposed to a deductive approach that is concerned with testing of hypotheses, an inductive approach starts by collecting data that are used to formulate hypotheses or theories emerging from the data analysis.

As a social constructivist in outlook, I believe that reality is subjective and experiential and that human beings construct their own social realities in relation to one another. My particular construction of reality might be shared with other people, but other people could construct the same reality in different ways. When individuals perceive the reality in the same way, there is inter-subjectivity or agreement between individuals that increases the possibility for a reality to be perceived as "true" (Jacobsen, 2005).

Interpretivism is a theoretical perspective that is closely linked to the epistemological position of constructivism (Gray, 2009). It claims that natural reality and laws of science (positivism) and social reality (interpretivism) are different and therefore, require different methods. Interpretivism regards reality, and knowledge of reality, as being culturally derived and historically situated, and it gathers information on feelings, meanings, and ideas using mainly qualitative methods.

The project is thus designed as a qualitative and inductive study within the research paradigm of constructivism. Qualitative research is usually conducted through contact with

a real-life setting and the role of the researcher is to obtain a holistic overview of the situation, including the views and perceptions of the participants (Gray, 2009). Qualitative data are subject to interpretations and include the voices of the participants and that of the researcher. Given the chosen approach, my own reflections, including critical self-reflection, are part of the research data.

Qualitative research usually works with purposive samples, because it seeks to obtain insights into particular practices that exist within a specific location, context, and time. Participants are identified because they are known to enable the exploration of a particular behaviour or characteristic relevant to the research. Qualitative data have part of the value in the context from which they are gathered and will lose some meaning when detached from whom, when, or where they are generated (Costley et al., 2010). Some context-based details get lost in the data analysis.

Although qualitative research is generally accepted as a scientific research approach, it tends to evoke standard criticisms and objections about the quality (Kvale, 2007). A common criticism is that it is not scientific because there are no quantitative data and testing of hypotheses. It is further criticised for being too person-dependent, biased, and based on subjective impressions, and for not producing findings that can be generalised. Among my target audience there might be individuals with a positivist perspective on knowledge creation who would question the qualitative research. Such scepticism can be counteracted by ensuring high quality in the research and by making the process transparent. Holliday (2007) argues that to achieve validity and rigour in the research, researchers need to show the workings in writing as explicit as possible so they can be accountable for how they have managed their own subjectivity and how the data presented support what they want to say. Researchers should also make sure that their claims are appropriate to the data collected and the arguments constructed around the data.

Research can also be classified according to purpose, which is reflected in the research questions. It can be exploratory, descriptive, explanatory and interpretive (Gray, 2009). This project seeks to explore the experience and views of participants in cross-border exchange of knowledge, and this is a little researched topic. This project can be regarded to have both an exploratory and interpretive purpose. Exploratory studies are often used when there is little existing knowledge or theory about the topic under investigation. Such studies require a method that generates in-depth data and is sensitive to unexpected situations and contextual factors. They often use qualitative methods without specific research

hypotheses (Jacobsen, 2005). Interpretive studies seek to explore peoples' experience and their views or perspectives on the experience. Such studies are typically inductive in nature and associated with qualitative data collection and analysis.

The chosen strategy of enquiry of the project is thematic analysis. Thematic analysis is a common form of analysis in qualitative research that focuses on searching and examining themes within textual data (Guest et al., 2012). Themes are patterns across data sets that are important to describe a phenomenon and are associated to the research questions. The themes become the categories for analysis. Thematic analysis suits questions related to people's experience, views, and perceptions.

Thematic analysis is related to grounded theory – a method developed by Glaser and Strauss (1967) and designed to construct theories that are grounded in the data themselves. In thematic analysis, the approach can also be inductive and content-driven, and the process consists of reading transcripts, identifying themes, comparing and contrasting themes, and building theoretical models. Grounded theory aims at building theory, but thematic analysis is not restricted to that purpose (Guest et al., 2012).

Thematic analysis is also related to phenomenology in that it employs a phenomenological approach aiming at describing the experience and perceptions of research participants. It emphasises the participants' perceptions, feelings, and experience (Moustakas, 1994). While phenomenology focuses on subjective human experience, thematic analysis can also include social and cultural phenomena (Guest et al., 2012).

4.2 Collection of data

In order to explore the experience and views on cross-border knowledge exchange of participants, I have used one-to-one interviews as the primary method for data collection. Individual interviews are suited when there are relatively few participants and when one wants to explore individual views and perceptions (Jacobsen, 2005). Interviews allow for detailed information, follow-up questions, and probing of responses, and this has given me more detailed insights into the participants' opinions than what would be possible using, for example, a survey questionnaire. In qualitative interview research, knowledge is not only collected but also produced in the interaction between the interviewer and the interviewee.

By way of comparison, in the NVF process (appendix 1) only a questionnaire was used to collect data from member organisations and committees, and it provided limited insights into the experience and views of the individual participants in knowledge exchanges.

In addition to individual interviews, I have held two series of focus group sessions – one series with interviewees and another series with other professionals. In addition, I have had individual consultations with employees of my organisation and with professionals abroad engaged in international activities.

Individual interviews

There are several types of interviews such as structured, semi-structured, and unstructured interviews. The semi-structured interview is frequently used in qualitative analysis (Kvale, 2007) and the most suited type for my research. The semi-structured interview allows for probing of opinions and views and for following up new leads, and this is important for exploring subjective meanings. I have used an interview guide that contains the core questions. The guide is shown in appendix 3.

Sample size and selection of interviewees

Since this is an exploratory study, interviews should ideally been conducted until a point of saturation where further interviews yield little new knowledge. At the same time, the amount of data collected has to be manageable, and up to twenty interviews are usually sufficient in qualitative studies (Jacobsen, 2005). According to Kvale (2007), the number of interviews in this kind of studies tends to be around 15 +/- 10.

The interviewees in this project are employees of my organisation who take part in international knowledge exchange. In order to obtain a representative sample, I have selected interviewees using criteria such as gender, educational degree, field of study, professional discipline, years of work experience, years of participation in international knowledge exchange, and international forums and/or bilateral cooperation in which they participate. It is difficult to know the exact number of interviews needed to generate new insights and knowledge about the research topic. My estimate at the outset was that around twenty interviews would be needed. All together eighteen interviews were carried out, eleven face-to-face and seven using web conferencing. No prospective interviewees responded negatively to the invitation and refused to participate, and no participant has withdrawn during the project. The invitation to take part in the interview is shown in appendix 4.

Appendix 5 gives an overview of the interview participants' profile. The sample consists of six women and twelve men with varied professional background, work experience, and international knowledge exchange experience. Most participants have substantial work experience, since this is usually required when taking part in the organisation's international activities. The eighteen participants work within thirteen different professional disciplines, but the disciplines are not shown in the appendix in order to properly conceal the participants' identity. The knowledge exchange methods experienced by the participants are committees and working groups of international forums, cooperation projects with other countries, staff exchanges, study tours, and conferences. Here, conferences also cover congresses, symposiums, seminars, and workshops. All respondents have experience from committees, working groups, and conferences, and all apart from one have been on study tours. Two thirds of them have experience from cooperation projects, while only a few have taken part in staff exchanges. In my view, the interviewees were selected using appropriate criteria, and they constitute a representative sample of participants in knowledge exchanges in my organisation.

The interview process

I developed a plan and process for how the interviews would be conducted with the aim of ensuring the overall quality of the data collection and analysis. To prepare myself for the interviews, I did test interviews with two colleagues who do not take part in the project. The test interviews enabled me to know more about how interviewees would react to the style and content of the interview and how I would react to them. The core questions of the interview guide were not changed based on the feedback received from the piloting.

In order for the interviewees to be prepared for and reflect on the questions, I sent them the interview guide about one week prior to the interview. By doing so, there was a danger that they would prepare themselves to behave tactically and give me institutionally desirable answers rather than their personal ones. I further made them unable to give me spontaneous responses to the core questions. Although I have a long-standing relationship with many of the interviewees, my new role as interviewer made it necessary to establish trust and rapport. To counteract possible tactical behaviour, I carefully explained my intention with the interview that was not to assess their performance and achievements, but to learn about their views and experience. I was presumably right in providing the interview guide in advance, as many interviewees had spent time on reflecting on the questions.

According to Jacobsen (2005), it is recommendable to start interviews by letting the interviewees talk freely about general issues. I began all the interviews with a couple of warming-up questions and asked the interviewees to tell me about their most useful and least useful experience with knowledge exchanges. To allow for a natural flow of the interviews, I tried to be flexible about the sequence of core questions. Their responses and my reaction to them led to probing and follow-up questions that made it possible to explore their views and experience in greater depth. I left the last question open, and here I posed different questions depending on previous answers given. I asked if there were any other issues not covered that they would like to address, or what international activity they would choose to take part in if they had a free choice.

As an insider, I have knowledge, insights, and experience that apply not only to the theoretical understanding, but also to the lived experience of my organisation's engagement in knowledge exchanges. According to Coghlan (2003), such preunderstanding is both an advantage and disadvantage. When interviewing, I could draw on my own preunderstanding to probe and follow-up responses and so obtain richer data. At the same time, being close to the data posed a threat of assuming too much and not probing as deeply as I would if I was an outsider. To counteract this threat, I tried to be open-minded and expose my thinking to alternative reframing.

All interviewees accepted the use of a digital voice recorder during the interviews. The interviews lasted between 45 and 60 minutes. They took place over a period of two months. In order to get rich and articulated responses, I found it necessary to conduct the interviews using the native language of the interviewees. I first transcribed the interviews in Norwegian and asked the interviewees to review the transcript so they could confirm that it was a representative account of their statements and opinions. The transcripts were then fully translated into English. When translating, there is a risk that the responses may lose some of their intent. I therefore tried to be careful in my wordings and formulations in order to keep the original intent of the responses. In order to check the quality of my translations, four randomly selected transcripts were reviewed by a bilingual person.

I transcribed and checked the interviews as they were conducted because I wanted to see if the interviewees were struggling to make sense out of any questions and if they were interpreting any questions in unexpected ways. In this way, I could make sure that the questions were well understood and further develop my interviewer skills during the

interview process. I chose to do the data analysis after having conducted all the interviews in order to avoid being influenced and biased by preceding interviews.

Focus groups

A focus group is an informal discussion among a group of selected individuals about particular issues. The intention is to gain an understanding of the issues from the perspectives of the group participants. Focus groups allow for group interaction between the participants and may encourage participants to make connections to various ideas through the discussion. The aim is not to reach consensus on the issues discussed, but rather to promote a range of responses, which provide a greater understanding of the opinions and perceptions of participants. The optimal size of such groups is between five to eight people (Jacobsen, 2005).

Purpose of sessions, number of sessions, and group size

I ran two series of focus group sessions that served two different purposes. The first series involved interviewees only and served to share preliminary findings with the interviewees, consolidate interview findings, and build a collective understanding about the findings. The second series involved a convenient sample of other professionals from the organisation. While the main purpose of this series was to ensure quality of the findings by triangulation, it also served to disseminate interview findings.

Having thematically analysed the interviews, I organised the first series of focus groups with interviewees. They were all invited to voluntarily partake, and two of them responded negatively. I divided the participants into three groups with four or six participants in each, since it is easier to promote discussion and engage all participants when the group is small. I did not use any specific criteria for forming the groups. They were simply formed according to the availability of the participants.

Regarding the second series, I invited professionals who I thought would provide valuable contributions. They work in various professional disciplines, which are represented in the international work and/or have some experience from international participation. I did not invite management staff to the focus groups as their presence could negatively influence the group interaction. Among the people invited to a focus group, four were not able to or did not want to participate. I conducted two sessions with six and eight participants respectively.

Focus group sessions

I opened the sessions by explaining the purpose of the group discussion and the way I had analysed the individual interviews. The participants were introduced to the themes emerging from the interview analysis. To initiate the following discussion, I had formulated questions as shown in appendix 8. To allow for spontaneous reactions and views, I did not provide the participants with the questions prior to the session.

I took the role of moderator, introduced the questions, and guided the participants in their conversation. In a workplace context, people may be reluctant to express their opinions or discuss their experience in front of colleagues. I was trying to make everybody feel comfortable enough to contribute to a dynamic discussion. All participants accepted digital voice recording, and in addition, I took notes during the sessions. The sessions lasted from 75 to 90 minutes. The three focus group sessions of the first series took place over a period of ten days, and the two sessions of the second series were conducted during one week. As for the interviews, I conducted the sessions in Norwegian. I prepared memos from the sessions that have been translated into English.

It was satisfying to see that the first series of focus groups engaged the interviewees. They appeared to appreciate the opportunity to discuss my interpretations of their responses with colleagues. In the second series, most participants took an active part in the discussions and showed a genuine interest in my research. They provided useful comments and feedback on my interview findings.

Individual discussions

Another measure to triangulate interview findings has been to discuss interview findings with individuals from both my organisation and road transport organisations abroad. I have held discussions with nine colleagues at home, including management staff, and twelve professionals abroad who are engaged in one way or another in international cooperation in the road transport sector.

In these meetings, I used the same issues as in the focus group sessions (appendix 8). In addition to crosscheck interview findings, the individual discussions served to disseminate the findings and create interest in my research in the organisation and in the international professional community. The discussions were not tape recorded, since they took the form of informal conversations. I took notes of the viewpoints and experience shared in these meetings. The people I talked with were indeed willing to share their experience and views,

and it is my impression that these conversations generated interest in my project both within and outside of my organisation.

4.3 Analysis of data

Individual interviews

There are no generally accepted rules about how qualitative data should be analysed, but there are some general principles that should be applied for sorting and locating meaning in the data (Costley et al., 2010). In this study, the interviews were analysed using the techniques of thematic analysis. As described by Guest et al. (2012), thematic analysis can be used to build theoretical models or to find solutions to real-world problems.

In thematic analysis, one should attempt to go beyond surface meanings of the data to locate meaning in the data and tell an accurate story of what the data mean. The final themes should make meaningful contributions to answering the research questions. Since this is an exploratory analysis, which is content-driven and inductive, the emphasis is on what emerges from the interaction between the respondents and me. The content of that interaction drives the specification of codes and identification of themes.

I first considered using structural coding. Structural coding is used to identify the structure imposed on the data by the research design and questions. It is typically used in structured interviews, but can also be applied in semi-structured interviews if the interview guide is used in a consistent manner (Guest et al., 2012). The questions in the interview guide would then form the basis for structural codes. By coding in this way, however, there is a danger that instances of something unexpected or unusual are ignored.

Structural coding did not appear to be an appropriate coding approach for two reasons. First, I was not fully consistent in the use of the interview guide, and second, structural coding could limit the discovery and surprising findings. I therefore decided on a more open and inductive way in which coding and theme development are directed by the content of the data. It is difficult to avoid, however, that the interview questions influence the evolving codes and themes.

I will here describe how I thematically analysed the data in a systematic way aiming at providing credible findings of the research questions. Themes were identified through a process of data familiarisation, data coding, and theme development. This was an iterative

process moving back and forth between the various phases of the data analysis until I was satisfied with the final themes. As Jacobsen (2005) points out, the themes should not only make sense to the researcher, but also to other people involved in the research. To that end, I held discussions with trusted colleagues, including some interview participants, during the process. This enabled me to see if my interpretations made sense to them and if I was able to provide new and meaningful insights.

I started by carefully reading the interview transcripts to make myself familiar with the content. From the reading, I was able to see obvious patterns and repeating issues in the interviews. I recorded these patterns in a journal in order to begin developing initial codes. I transferred the full interview texts into a spreadsheet in order to facilitate the analysis and applied a coding system where statements could be traced back to the original interview text.

I first considered classifying the interview questions into research question groups thinking that it would make it easier to identify similarities, differences, and patterns in the data. In this way, however, the questions asked could more easily influence my understanding and interpretations of the responses and make me ignore other aspects brought up by the interviewees. I therefore sorted the spreadsheet simply by interviews.

In their responses, the interviewees often addressed more than one issue, and in these cases, I split the responses into smaller text segments to avoid overlooking important details. The text segments of the analysis could consist of a few sentences or only one sentence depending on the content. An extract of an interview transcript is shown in box 4 below. The first column shows the participant number (P#) and the question number (Q#), and the third the response divided into smaller segments.

In the next step, I generated codes that identified important features of the data. The process of creating codes can be described as both data reduction (simplification) and data complication. By using simple but analytic codes, it is possible to reduce and organise the data in a more manageable way. It involves identifying segments of data that share a common code by noticing relevant phenomena, collecting examples of the phenomena, and studying phenomena to find similarities, differences, and patterns. Data complication is used to expand on the data to create new interpretation of the data. It serves as a means of providing new contexts for the way data are viewed and analysed.

P#-Q#	Question	Response segments
P11-Q20	What can the professional community and the organisation do to get more out of your participation?	They should allow the staff more time to take part in committee work and projects.
		The organisation should also set requirements regarding sharing and dissemination of relevant information and results. Perhaps they also should follow-up the staff more closely. I think some people are left more or less alone with their international work.
		The participants in the various activities should be selected based on professional qualifications. It is not right that managers take part in projects. It is important to have the right people in the right place.

Box 4: An extract of an interview transcript

When coding, I was looking for the kinds of things such as satisfaction, dissatisfaction, preferences, feelings, attitudes, impressions, conditions, actions etc. With the view to increase richness in the analysis, I did not limit the number of codes for each text segment. I first generated initial codes that were essentially descriptive in nature and expressed the explicit or surface meaning of the data. Then I attempted to develop more analytic codes reflecting what I found to be the implicit or intended meaning of the data. In a few cases, I could use words of the participants to assign a name to the code. For example, the response below gave rise to the code “English skills”.

Response segment	Code
The main problem is language, and the use of English is a barrier for me. I can read and write without problems, but I do not speak English as fluently as I should. When I discuss with other people who are not fluent in English either, we do not get a clear understanding of what is said.	English skills

Box 5: A code developed by words of a participant

In most cases, I created more analytic codes by reflecting on the underlying meaning of the statement. For example, my interpretation of the response below is that participants in international knowledge exchange need to possess some kind of “sociocultural understanding”.

Response segment	Code
We also need to be aware of different cultural conditions that require adaptation and not immediate use of technologies and solutions.	sociocultural understanding

Box 6: A code developed by interpretation of response

The codes were developed through a process of adding, subtracting, combining and splitting potential codes. I was concerned with paying full and equal attention to all the data with the view to identify any unnoticed repeated patterns. In some instances, codes were closely related to one another, and I could easily form a supercode. The example below shows the formation of a supercode named “sharing constraints”.

reluctance to sharing	management support for sharing	procedures for sharing
time available for sharing	information management system	

Box 7: An example of codes forming a supercode

Having developed a set of codes, I collated the text assigned to the various codes to crosscheck whether the codes represented the meaning of the text. As I was working with translated transcripts, I had an additional challenge in the coding process. In order to assess whether my interpretations made proper sense, I crosschecked the codes developed with the original transcripts in my native language.

The following step was to identify themes, or broader patterns of meaning, by careful examination of the codes and the data. In thematic analysis, themes consist of over-reaching ideas and descriptions that are used to explain what derives from the participants' stories and generate new insights. According to Jacobsen (2005), it is important that themes are neither too specific nor too general.

I began by examining how codes combined to form potential themes in the data. I collated data relevant to each potential theme in order to assess the viability of the themes and determine if they told a convincing story of the data. I searched for data that supported or refuted the themes. I repeated this process until I had an idea of what the themes were and how they fitted together. The themes were to form coherent patterns, be mutually

exclusive, and reflect the meanings in the data in order to provide an accurate representation of participants' views and experience. At this stage too, I crosschecked potential themes with the original transcripts.

I examined the emerging themes within the whole picture and also as autonomous themes with the view to identify the story of each theme and its significance. This enabled me to define what the final themes consisted of and to explain each theme in a few words. Finally, I decided on informative names of the themes.

An example of how codes were combined to form a theme is shown in box 8 below. Here the codes relate to a common theme named “the receiving environment” which is about conditions in the participants’ home organisation that affect the use of new knowledge from abroad.

attitudes towards knowledge from abroad	demand for knowledge from abroad	need for knowledge from abroad
integration of knowledge exchange	priority of knowledge exchange	strategies for knowledge exchange

Box 8: An example of codes relating to a common theme

An extract of the coded interview transcripts with codes and themes is provided in appendix 6. The complete combination of codes and supercodes into themes is shown in appendix 7.

The narrative is presented in the next chapter. I have not found it appropriate for the analysis to quantify the qualitative data because the research approach is exploratory and interpretive and the aim is to build a model. Only qualitative descriptors are used in the narrative, such as most, many, several, some, and few.

Focus groups and individual discussions

The interdependent nature of the responses of focus groups has implications for the analysis, and the data cannot be analysed as data from individual interviews (Guest et al., 2012). The interaction in focus groups needs to be captured, and trends in the group data should be analysed rather than individual frequencies.

In both series of focus groups, I analysed the responses by issue (appendix 8) using the tape recordings and my memos. In my analysis of the group discussions, I focused on the level of engagement and intensity of discussion and on the time spent on the various issues, which tells something about its significance to the participants. I further took note of the level of agreement and disagreement to each issue. In doing so, I was concerned with interpersonal influences and whether participants persuaded each other to the affirmative or negative during the discussions.

In the analysis of individual discussions, I focused on the level of consistency in opinions and experience, and on information that could enrich my understanding and interpretations of the interview findings and put them in a broader context.

4.4 Ethical and quality considerations

Researching views and experience of others carries with it ethical implications. Ethical issues in research involve the researcher's responsibility to ensure quality in the process and product, no harm made to participants, participation based on informed consent, and respect and protection of participants' privacy. Costley et al. (2010) stress the importance of an ethics of care for those taking part in research, and I have paid attention to integrating ethical concerns throughout the research. To that end, I have attempted to invite prospective participants without making them feel obliged to take part, and to make them feel confident that all data would be treated with full confidentiality and that their identity would be properly concealed in the project report and in the dissemination of results.

There was a danger that the participants would misinterpret my intention with the project and my role in it as an insider-researcher. As stated by Edwards (2002), apart from matters of disclosure and anonymity there is a need to justify such intrusions, willingly though they may be granted by the participants. My new role as a workplace-researcher and the resultant shift in the power relationship between the participants and me could have implications on their behaviour. They might choose to respond tactically instead of honestly if they felt intimidated or criticised. They needed to be properly informed about what their participation would involve, what the project sets out to achieve, and how its outcomes would be disseminated. It was important to make it clear to them that the project is not about evaluating their performance and achievements but exploring ways of improving

results of international knowledge exchange by using their experience and views as a source.

Participants have given their written consent by signing a consent form. The consent form is found in appendix 4. The form sets out the purpose of the study and the expected contribution by participants, if they were willing to take part. It also states the voluntary participation and the right to withdraw the consent at any time, and that participants would be anonymous in the project and all information provided would be treated with full confidentiality. I further informed participants about the ethical approval of the University ethics committee and the notification to the Norwegian Data Inspectorate. I presented the consent form orally to the participants before obtaining written consent in order to ensure understanding of the research's purpose and their rights as participants.

Interviewees' anonymity is secured by allocating a number to each of them (P1, P2, etc.), and by avoiding any information and description in the report that can unveil their identity. The data in the project are not sensitive personal data according to Norwegian Data Inspectorate (2013), but I have paid attention to treating the data in a way that the participants feel they have a voice in the research without being identified in the results dissemination.

I was prepared for the situation where the research could be challenging in terms of maintaining both good relationships and my integrity as researcher. I have put efforts into making the participants feel that their contribution is important and valuable, and in my interpretations, I have tried to give a fair and balanced account of the participants' contributions. It is my perception that I have been able to build trust and maintain good relationships with the participants, and that they have shared views and experience with me confidently and frankly. The interpretations of responses are therefore based on an understanding of openness and honesty.

As concerns the quality of the research, it can be judged by its validity and reliability. In qualitative research, the internal validity concerns to what degree the results are credible from the perspective of the participants. The external validity refers to the degree to which the results in unique settings can be generalised or transferred to other settings. The reliability is about stability (internal) and replicability (external) of the results and to what extent the research design affects the results.

According to Jacobsen (2005), the strength of qualitative studies is that they generate rich and relevant data connected to a specific context and have high internal validity. On the other hand, the external validity is low, since it is difficult to generalise or transfer the results to other contexts with a small and context-bound sample. In qualitative studies, the nearness to the participants and the setting can affect the researcher's ability of critical reflection, and thereby reduce the internal reliability. External reliability is difficult to achieve in qualitative studies dealing with unique settings.

In interview research, the issue of internal validity is about ensuring that the interviews address the research questions. To that end, I have discussed the interview questions with experienced colleagues and piloted the interview guide. The sample and the data collection process also influence the internal validity. I believe that I have been able to form a diverse group of interviewees who represents a cross-section of employees engaged in international cooperation, and I am largely satisfied with the sample. Data collected from a variety of participants provide a valid description of their reality.

I have further tried to ensure internal validity by reflecting on my influence on the interview process and how I conducted the interviews. As Kvale (2007) points out, a research interview is not an egalitarian dialogue between equal partners, but entails a specific power asymmetry where the interviewer sets the stage for the interview, controls the sequence, and uses the outcome for own purposes. The interviewees, on their side, have the power to choose how to respond.

In order to reduce the response effect where interviewees give me answers they think I expect or would like to get, I have attempted to make my intentions clear and make the participants feel free to express themselves without fearing any negative consequences. Apart from the response effect, interviewees can also be unconsciously selective and their responses influenced by what they thought to be important. During the interviews, I have tried to be open-minded and free of my own biases and prompted the interviewees to illustrate and expand on their responses. The internal validity has been further enhanced through checking by interviewees. Interviewees have reviewed the transcript of their interview for accuracy and for adding any further comments.

The analysis and interpretations of data also affect the internal validity. There should be a strong link between the evidence provided and the theories, concepts, and ideas develop from it. While insider research can provide great insights, it can also be a burden, since the material is so commonplace for the researcher that the nuances and the obvious can

escape attention (Edwards, 2002). To counteract potential blindness, I have carried out a thorough process in developing themes from the data. No other researchers have been involved, but I have discussed my interpretations with trusted colleagues. In the presentation of findings, I have used quotes and examples that support findings or exemplify concepts in order to increase the transparency. Quotes and examples are selected from different participants to demonstrate that findings cut across participants. However, while verbatim data present what the interviewees actually said, they do not necessarily represent what they think. My insider-researcher role and the way I carried out the interviews may have mediated the responses.

Both the participants' and my own views and experience pose the threat of subjective bias. In order to counteract biases, I have crosschecked findings and used critical reflection. The validation of interview responses by focus groups with interviewees has been very important and useful, but feedback from interviewees is not sufficient because there might be issues that the interviewees ignore. Triangulation of the findings by others in focus groups and individual discussions has been necessary to test the validity. I have compared data from individual interviews, focus groups, and individual discussions and considered the degree to which they converge or diverge. These means of triangulation have largely confirmed the findings, and thereby increased the internal validity of the research. As I have own experience from the topic, I have also made myself part of the triangulation by checking the participants' opinions and statements using my own experience and critical reflection. In addition, the analysis has been enriched with literature that, to some extent, serves as confirmation of the analysis.

In qualitative studies, the issue of generalisation (external validity) should be approached with caution (Guest et al, 2012). My research is context-bound and small-scale, the sampling purposive, and the external validity is restricted. It is located within the context of my workplace, and the findings do not necessarily apply to other organisations in different environments. Holliday (2007) argues, however, that in qualitative research, generalisability of knowledge can be replaced by transferability of knowledge from one situation to another. According to Maxwell (2005), face generalisability is often found in qualitative studies meaning that there is no apparent reason not to believe that the results apply more generally. A qualitative study can lead to development of theory or concepts that can be extended to other settings. In other settings there may exist similar features and conditions that lend plausibility to generalisation. Based on feedback from the discussions with

professionals abroad, the results are likely to have face generalisability and applicability to other organisations taking part in international knowledge exchange.

The collection and analysis of data affect the internal reliability, or the stability of the findings. In interview research, the internal reliability depends on how the interviewees choose to respond and how the interviewer behaves (Jacobsen, 2005). Participants in this research were given the interview guide in advance and had time to prepare themselves for the interview. As noted earlier, I have no reason to believe that the interviewees behaved tactically and gave me institutionally desirable responses. I therefore assume that they have provided a fairly correct description of their perceptions and opinions.

In interviews, there can further be a problem of interviewer bias meaning that the interviewer behaves differently with the interviewees. I have paid attention to being as unbiased as possible and conduct all the interviews in a similar manner. The problem of interviewer bias is reduced when there is only one researcher, but at the same time, the internal reliability can be strengthened if two or more researchers are involved. Since I am the only researcher, I have relied on experienced colleagues to ensure that my analysis makes sense. The precision in the data collection is also important, and I have made efforts in being as accurate as possible by means of tape recording, checking transcripts by interviewees, and checking translations by a bilingual person.

Qualitative studies are unique and context-bound, and they cannot be replicated to produce the same results. The triangulation has, to some extent, validated the results, but reflexivity is also needed to compensate for the lack of replicability. I have therefore been conscious about my role in the research, how it has influenced the project, and critically reflected on other factors that have affected the research. The use of a qualitative and inductive approach has given me a great deal of new information and insights on the research topic. I consider the chosen approach to be suitable and workable to the project's purpose and context.

5. Research findings and discussion

As outlined in the preceding chapter, I collected data from individual interviews and had discussions on the findings in focus groups and with individuals. In this chapter, I examine the themes emerging from the interviews and link findings back to existing knowledge and information dealt with in chapter 3. For each theme, I highlight the key findings and present issues to which I asked focus groups and individuals to respond. Appendix 8 lists all issues of focus groups and individual discussions. I discuss responses from focus groups and individuals, and I conclude each theme by pointing out the potential for making improvements in the knowledge exchange process.

5.1 The six emerging themes

The thematic analysis of the interview transcripts described in the previous chapter resulted in the following six themes. I have explained the themes with a few words to make their meaning clear.

1 – *Preferences for ways of exchanging knowledge* – refers to how participants value interaction and communication in exchanges and structuring of exchanges, and kinds of activities

2 – *Facilitation of knowledge exchange partaking by the organisation* – refers to how participants view ways of organising the partaking in knowledge exchanges by the home organisation

3 – *Interactions in multicultural settings* – refers to how participants experience interactions between different cultures and countries

4 – *Introduction of new knowledge in the organisation* – refers to how participants introduce knowledge from abroad in the home organisation and factors that influence the introduction

5 – *The receiving environment* – refers to how participants perceive conditions in the organisation in terms of receiving knowledge from abroad

6 – *Benefits of knowledge exchange* – refers to how participants perceive benefits for themselves as individuals and for the organisation

In the following sections, I convey the story within and across the themes. To illustrate important issues, I use quotes and examples from the interview transcripts.

5.2 Preferences for ways of exchanging knowledge

5.2.1 Interview findings

The interviews provide insights into preferences for interaction and communication, structuring of exchanges, and activities. When it comes to ways of interacting and communicating in exchanges, it is clear that most respondents strongly emphasise the value of meeting professionals from abroad and building networks. This indicates that exchange of explicit knowledge through documents, databases, etc. does not suffice. It appears important for them to learn from the experience of others and exchange tacit knowledge. According to Polanyi (1966), it takes personal contact and social interaction to share tacit knowledge. Sharing of tacit knowledge is the socialisation process of the SECI model developed by Nonaka and Takeuchi (1995). Knowledge sharing in general, and tacit knowledge sharing in particular, depends on trusting relationships, and face-to-face contact plays an important role for building trust (Fukuda-Parr and Hill, 2002; Yu et al., 2003; McNichols, 2010).

The sample shows that participants use the networks they develop in exchanges as a source of information and knowledge when the need arises. The value and the use of networks are well illustrated by this participant:

(P3) "The network I get is certainly useful, and I have enjoyed developing my network. It is very useful since I easily can make a call or send an email to my contacts abroad to ask about their knowledge and information on solutions and other things when I need it. When I make an enquiry to authorities abroad, it is difficult to get response. It is so much easier to get response when I call or email somebody I know from international work."

The networks developed function as communities of practice (Wenger, 1998) where members interact and share both tacit and explicit knowledge. Such networks exist as long as the members see the need for it. Networking has become a common way of interacting and communicating in knowledge exchange because it facilitates exchange of tacit knowledge and provides knowledge "just in time" and "just enough" (Denning, 2002). Tacit

knowledge must, according to Denning (2002), be acquired afresh or rediscovered by each new person and in settings where people can informally exchange views.

The interviews reveal that virtual communication in exchanges is quite limited. Emails and phone calls are most frequently used for making enquiries. Very few respondents have experience with virtual meetings in addition to in-person meetings when they take part in a group or a project. This is, however, not a choice made by them, but has to do with the ways of working of international forums. No participants believe that virtual meetings can replace face-to-face meetings, but there is a general opinion that using such meetings as a supplement to in-person meetings can be useful. The group size, however, may cause a problem. International groups often have up to 20-25 members, and it can be difficult to organise meetings virtually for such big groups in an effective manner.

As shown in appendix 5, the interview participants are above the age of digital natives, and they may hold conservative attitudes towards or have low comfort using technology-mediated exchanges. It is likely that virtual exchanges will play a more important role for the new generation of digital natives. This is demonstrated in the survey among professionals below 45 years of age (World Road Association, 2014) where most respondents express positive attitudes towards virtual exchanges. There is on-going research looking into whether social web environments are suited for sharing of tacit knowledge and can replace face-to-face contact (Panahi et al., 2013). However, as discussed above, studies show that knowledge sharing is based on trust that is facilitated by face-to-face contact. According to von Krogh et al. (2006), it is also difficult to create engagement without face-to-face interaction.

The interviews further show that participants are concerned with how the exchanges are organised and structured and how it affects the interaction. Group size seems to play an important role. Several respondents express a clear preference for taking part in small groups, since it is easier to interact with people, such as in this case:

(P12) "I prefer methods where I get in close contact with other professionals, and I benefit most from taking part in small forums and groups with few people."

Small groups further stimulate the contribution from each member. Experience from the U.S. also shows that small groups are particularly good for international exchanges (Transportation Research Board, 1995).

Having clear targets of the exchanges appears to be of importance for several interviewees as illustrated by this one:

(P15) "I think that taking part in working groups give me most. I prefer small groups where there are presentations and discussions. It is important to have clear objectives of the work."

In the sample, there are a few instances of exchanges being constraints by poorly defined targets. Experience within knowledge exchange from development cooperation shows that effective networks and groups are small and have well-defined objectives (Fukuda-Parr and Hill, 2002).

In addition to small groups and clear targets, several respondents emphasise the importance of relevant technical focus that allow them to acquire more in-depth knowledge about a few issues. As one participant states:

(P6) "To take part in workshops that focus on specific topics is very useful."

The findings indicate some dissatisfaction among participants about the lack of technical focus in working groups and cooperation projects. Some respondents find that too much time and efforts are spent on administrative matters in meetings, leaving little time for technical discussions. Bureaucratic procedures and need for coordination create in some cases an administrative burden on the members of groups and projects. This is well illustrated in this case:

(P14) "I remember that I went on a one-day meeting to Brussels, and we spent half the meeting on being told how to fill in the travel claim form of the trip. My little experience with such x-projects is that they have cumbersome and bureaucratic processes that take time."

Another issue related to relevant technical focus of exchanges is contact and cooperation between working groups of the same international forum. This issue appears, however, to be important to a few participants only. International forums usually organise groups of specific topics, and some of them encourage cooperation across groups to allow for more interdisciplinary learning and synergy. It appears, however, that a few participants do not value such intergroup cooperation. They prefer to focus on the designated topics of his/her group and develop a strong network between the group members.

Well-scoped and bounded exchanges facilitate in-depth exchanges, but at the same time, mingling with professionals of other related disciplines holds the possibility of unexpected ideas and insights. Experience from innovation processes shows the importance of such boundary spanning for the generation of new knowledge and ideas (Chesbrough, 2003). According to Johnsen (2010), good ideas develop over time in people's minds as they come across related ideas from others. Good ideas often emerge in liquid networks and serendipitous connections. In the context of knowledge exchanges, it can therefore be valuable for the participants to cross the boundaries of his/her discipline.

It becomes clear that participants want effective exchanges that meet their expectations for acquiring new knowledge within their specific field of work. This requires careful preparations and planning of exchanges and of what exchanges to take part in. In this connection, the U.S. scanning programme (Federal Highway Administration, 2015) can serve as an example of well-structured knowledge exchanges that have yielded valuable results.

The participants take part in both long-term and short-term methods, and obviously, the duration of exchanges affects their learning. According to Denning (2002), exchange of tacit knowledge takes time and social context, and short timeframes allow mainly for exchange of information and explicit knowledge. The sample shows that participants make contacts and build networks primarily from long-term methods, such as committees, working groups, and cooperation projects. Short-term methods, such as study tours and conferences, do not offer the same opportunities for network-building, but participants seem to value these methods too. Study tours appear to be more valued than conferences, because they allow for a higher level of interaction and exchange of tacit knowledge in a real-life context. They provide an opportunity to see how things work in practice. Conferences do not usually have a defined context, and they are more suited to get a state-of-the-art overview and to learn what knowledge exists. Such events do not provide for in-depth learning, but as discussed above, the level of interaction depends on the size of the event.

The sample demonstrates that exposure to various methods, both long-term and short-term, provides for different learning experiences. The experience of the World Bank (2014) shows that effective knowledge exchanges have a blend of long-term and short-term interventions.

When it comes to activities, there is a clear preference among the interviewees for multidirectional (collective and interactive) activities, such as group discussions, site visits to see practical solutions, and production of joint reports. Some interviewees also appreciate unidirectional (individual) activities, such as listening to presentations and giving presentations. Reading, on the other hand, appears to be valued only by a few respondents. Multidirectional activities provide for more dialogue and interaction than what unidirectional activities do, and the participants' preferences reflect their wish for tacit knowledge in addition to explicit knowledge.

Some participants make a distinction between activities as concern their purpose. It seems that exchanging existing knowledge is perceived as the main purpose of the activities of committees and working groups, while co-creation of new knowledge is the main purpose of the activities of cooperation projects. In my view, however, it is difficult to make such a clear distinction, since exchange of existing knowledge and creation of new knowledge can take place at the same time. Exchanging existing knowledge can stimulate the creation of new knowledge when participants actively engage in the exchange and reflect on what comes out of the dialogue.

The findings of the one-to-one interviews accord well with those of the survey among member organisations and committees of the NVF as part of the strategic development process (appendix 1). The survey revealed a preference for exchanging knowledge through long-term committee work that provides for in-depth, face-to-face interactions, continuous learning, and network-building. It also showed that committees prefer to focus on their designated topics.

The interview findings further resonate with the learning pyramid (of the National Training Laboratories in Bethel in the U.S.) in that active participation results in higher retention rates. Several theories and models exist on how individuals learn, such as those of Kolb and Fry (1975), Kolb (1984), Honey and Mumford (1982), and Fleming (VARK, 2015). The information from the interviews does not suffice to identify individual learning styles, but the participants' expressed preferences for ways of exchanging knowledge reflect, to some extent, their personality type.

The four function pairs of the Myers-Briggs Type Indicator (MBTI, 2015) referred to in section 3.2.1, can serve as indication of how participants act in exchanges. The four combinations are sensing-thinking, sensing-feeling, intuition-thinking, and intuition-feeling. Because of limited data on each participant, I have not attempted to classify each of them

according to these combinations. In the next chapter, I have used generic function pairs data and my interview data to develop a set of four profiles of knowledge exchange participants. These profiles can be used in the design of knowledge exchange initiatives. The interviews show that participants feel more comfortable with, and learn more from, some settings and methods/activities than others. By taking into account individual preferences for ways of exchanging knowledge, it is likely that the learning and benefits will increase.

Summary of key findings from interviews:

- Interaction and communication: There is a clear preference for exchange of tacit knowledge through social interaction and networking with other professionals. Face-to-face contact, which contributes to building trust, is more valued than virtual contact.
- Structuring of exchanges: Exchanges of knowledge in small groups are most appreciated. Small groups facilitate the communication and the exchange of tacit knowledge. Exchanges that have clear objectives and relevant technical focus are most beneficial.
- Kinds of activities: Multidirectional activities are preferred to unidirectional activities, since they involve more dialogue and interaction, and more exchange of tacit knowledge.

5.2.2 Responses to interview findings

Issue of discussion in focus groups and with individuals:

- To what extent the participants' preferences for ways of exchanging knowledge should guide the selection of knowledge exchange methods and activities

Focus groups with interviewees

It is clear from the discussions that individual preferences and learning styles is not an issue of particular concern to the organisation today. The participants confirm that their preferences are not taken into account in the selection of methods and activities. No participant can recall having been involved in a discussion about how s/he prefers to exchange knowledge. It appears, however, that matching of preferences and methods is, to some extent, self-adjusting in that employees tend to decide on their own what methods to

take part in or not. By way of example, a person who does not benefit from attending large international conferences may opt not to attend, and a person who does not enjoy working in groups, may opt not to join an international committee.

Many interviewees seem to be in favour of some accommodation of their preferences in order to enhance the learning. They would welcome some kind of mapping of their personality and preferences, applying for example the MBTI function pairs, as a way of making themselves more conscious about how they act in exchanges. At the same time, most interviewees seem to hold the opinion that the organisation's need for knowledge is the most important factor for the choice of methods. For example, when the organisation wants to get an overview of current practices or state-of-the-art within a particular field, large conferences can be very useful. When it is in need of more in-depth knowledge about a specific issue, an international project or a working group can be the most useful method. If individual preferences become a too dominant factor in the choice of methods, there is a risk of not acquiring the knowledge needed and not achieving the intended capacity development.

Focus groups and individual discussions with non-interviewees

Discussions with other people, both from within the organisation and abroad, indicate that individual preferences for ways of exchanging knowledge do not play a role in the selection of methods. There are different opinions both within and outside of the organisation on this issue. A few people argue that participants in international exchanges should simply accept and adapt themselves to different kinds of exchanges. They rather emphasise the importance of matching knowledge needs and methods and adapting exchanges to timeframes and budgets.

Some respondents are concerned with the cost-effectiveness of exchanges and are strongly in favour of virtual exchanges and use of ICTs. It is the experience of some people that ICTs are suitable for discussing conceptual issues, but less suitable for discussing operational matters involving experience and practical know-how. Saving costs by using ICTs is clearly an attractive solution as far as finances are concerned, but it is in conflict with the stated preferences of participants for personal contact, socialisation, and exchange of tacit knowledge.

Most respondents, however, clearly acknowledge the relational aspects of international exchanges and the importance of trust and credibility. Although it is not common practice

to consider participants' preferences, they appear to be in support of the idea. They see a potential positive impact on participants' learning by accommodating their preferences. Mapping of personal styles and preferences can also make participants more aware of how they act and learn in exchanges. Additionally, it can have a valuable psychological effect on the participants if they have a say in the choice of methods, and they may feel the organisation takes their learning more seriously.

In several discussions, respondents stressed that organisations often apply multiple methods and activities to meet the same needs for knowledge, and in such cases, there are more possibilities for accommodating individual preferences.

The idea of considering individual preferences and learning styles in the choice of methods finds support among many respondents from within the organisation and among professionals abroad. It has to be balanced with the organisation's knowledge needs, which are considered most important, and other factors such as timeframes and budgets.

5.2.3 Potential for improvement

The potential for improvement identified within this theme concerns the selection of methods and activities, more precisely the inclusion of participants' preferred ways of exchanging knowledge in the selection. Today, little attention is paid to this issue, and there are examples of participants taking part in methods and activities that do not correspond well with their preferences. Although most participants are likely to know something about how they prefer to learn, the use of diagnostics, such as the MBTI function pairs, can tell them more about their personality and how they act in exchanges.

- **In order to increase the participants' learning and benefits from knowledge exchanges, one should involve the participants in the choice of methods taking into account their preferred ways of exchanging knowledge.**

5.3 Facilitation of knowledge exchange partaking by the organisation

5.3.1 Interview findings

The interviewees address several issues concerning the arrangement of international exchanges in the home organisation. These issues relate to the organisation's policy for international activities as described in section 3.4.4.

An issue of particular concern is who to take part in exchanges and the appointment criteria. This is a key issue, since the success of a knowledge exchange depends largely on having the right individuals involved (Korea Development Institute and the World Bank, 2011; World Bank, 2013). The organisation has formalised procedures for selecting candidates and some general requirements for staff members to be involved in exchanges. Interviewees emphasise the importance of professional qualifications in exchanges as illustrated in this case:

(P15) "In my view, the outcomes depend on the participants in international forums. The participants' knowledge and skills decide to a large extent what comes out of the work."

To judge from interviews, however, professional qualifications do not always seem to be the main criterion. Participation in exchanges by managerial staff appears to create frustration. A few respondents argue that managers are not in a position to share and disseminate what they have learned to the same extent as their co-workers. One participant puts it in this way:

(P11) "The participants in the various activities should be selected based on professional qualifications. It is not right that managers take part in projects. It is important to have the right people in the right place."

Interviewees further claim that international work is more important for employees who are involved in research and development activities, development of guidelines and handbooks, and implementation of new techniques and methods than what it is for other categories of personnel.

Another issue of frustration appears to be the attendance at international conferences. Some participants are of the opinion that the organisation uses conference attendance as a kind of reward for good work. The situation is illustrated in this case:

(P7) "It seems to me that conference attendance is to be fairly distributed among the employees, and to some extent, dependent on whether you have submitted a paper or not. It is almost regarded as a bonus for good work."

The above findings show that respondents do not fully accept the current practice for selecting exchange participants, in particular conference participants. There is apparently a need for more transparent processes of appointment of staff members that are based on clear selection criteria. In this regard, one should be aware that there are often interpersonal factors, like status and prestige, associated with international participation that can create competition and rivalry among staff members. This makes transparency and clarity in the selection processes even more important.

In addition to the issue of who to participate internationally, interviewees also address the issue of how to take part, more specifically, individual versus collective participation. According to statements by some respondents, they prefer to go on study tours and attend conferences abroad together with colleagues rather than as the only employee from the office. It can be particularly useful when employees with different roles and responsibilities go together as they can consider a topic from different perspectives as illustrated in this case:

(P1) "I went on a study trip to country x that was a very useful learning process. I went there with a group of colleagues from two different units. It was interesting to have discussions on various problems and solutions with colleagues who have different views and perspectives."

As discussed in the previous theme, interaction between professionals of other disciplines can bring about unexpected insights and ideas and contribute to broader perspectives. However, as stated by one respondent, going with colleagues abroad can also be a disadvantage as such groups tend to stick together and making contact with new people becomes more difficult.

Group tours with colleagues allow for discussing impressions and viewpoints during and after the events, and the shared experience makes it easier to follow-up on what they have learned. Experience by the World Bank (2014) also shows that groups on study tours can

develop a shared understanding of constraints and opportunities, and improved consensus and collaboration.

The organisation usually provides for groups of colleagues to take part in short-term methods, such as study tours and conferences. This is not the case when it comes to participation in long-term methods, such as committee work, working groups, and cooperation projects of international forums. Traditionally, the office appoints one employee to take part in such international activities. Statements by interviewees indicate that this practice serves to develop the person involved, but not necessarily the organisation.

Several interviewees are concerned about lack of collective learning and teamwork in the organisation when it comes to their participation in international forums, such as in this case:

(P11) "I think some people are left more or less alone with their international work."

When participants take part in international groups and projects, there are no colleagues formally appointed to provide backing and act as discussion partners. As expressed by one of the participants:

(P17) "The problem is that I am the only person from the road administration taking part in the x-committee. Ideally, there should be at least two people involved. I miss to have somebody in my organisation with whom I can discuss views and ideas."

In collective learning processes, such as teamwork, employees get the opportunity to work closely with others and are encouraged to share knowledge (Cabrera and Cabrera, 2005). A team can further develop a shared understanding and meaning about the learning process and the learning (Garavan and McCarthy, 2008). In the participants' organisation, teamwork is a common way of organising the work, and it is not surprising that there are respondents who find it strange and difficult to be the sole participant in an international group without any kind of involvement by colleagues. As expressed by this participant:

(P12) "I think it will be a great help for me and for my colleagues who are in the same situation if we can get support when we take part in various forums."

The work in international forums is of relevance and interest to many employees, and it will be an advantage involving a team of colleagues rather than one employee. Team learning is, according to Senge (1990), a necessary discipline in order to become an effective

learning organisation. Teams can consist of people from the same unit or from existing internal networks. According to the World Bank (2014), one should not only think of how and what participants can contribute as individuals, but also how and what they can add to the group dynamics. Putting different kinds of people together with diverse background and perspectives can enrich the learning process.

The tradition of appointing one employee to take part in a group or a project also makes the organisation vulnerable. When one person is responsible for the knowledge acquisition, there is a danger of losing the knowledge if the person leaves the organisation. This participant exemplifies this situation:

(P10) "Another thing is that the organisation should avoid having only one staff member working internationally within a particular field. This was the case within xxx. The only person having an international network left the organisation."

The findings give reason to believe that the participants' learning from abroad should be a collective undertaking rather than individual. If a group of colleagues takes part in the work of the same international group or project, they will gain collective experience and are likely to learn more than one person alone. It will ease the introduction of new knowledge to the organisation and make the organisation more robust to staff turnovers.

An alarming finding concerns the relevance of conference attendance and choices made by the organisation and the participants about both which conferences to attend and which sessions to attend at a conference. A large number of interviewees express dissatisfaction with conferences, and in particular large conferences. They sometimes get disappointed at such events because sessions and presentations are outside of the scope of their domain and interest. This case illustrates the situation:

(P15) "As I mentioned, I do not get much out of conferences. Some conferences are good, of course, but the chances for being disappointed are higher at conferences than what they are with other activities."

The conferences themselves are, however, not to blame for this, but rather the organisation that sends employees to conferences that are not particularly relevant, and the employees who have problems choosing which presentations to listen to. One cannot expect that all sessions at a conference are relevant and interesting to all attendees. Regardless, there is a need for more careful planning and preparations of conference attendance to make sure that at least parts of the programme are relevant and useful.

Attendees can further share the conference programme with colleagues in advance to see if there are sessions of interest to others. If so, they can attend sessions of own interest and other sessions as proxy information gatherers for colleagues. Both conference organisers and individuals are increasingly using Twitter and other social media during conferences in order to interact and share real-time information with a wider audience (Ebner and Reinhardt, 2009; Letierce et al., 2010). In such cases, anyone can virtually attend. It appears that the interviewees and their colleagues are not among the early adopters of this new opportunity. By making use of social media, such as Twitter, proxy attendees can interact with interested colleagues during sessions, and when conferences have an official hashtag, they can also add it into their tweets and get real-time information. In this way, more information is gathered from conferences and more discussions can take place between colleagues during and after the events.

Participants' dissatisfaction with conferences can also have to do with their preferences for exchanging knowledge as discussed in the previous theme. While participants tend to prefer tacit knowledge exchange involving social interaction and networking, small groups, and multidirectional activities, conferences mainly offer unidirectional exchanges and access to explicit knowledge without a particular context. However, as discussed above, use of social media can provide for more multidirectional exchanges and interactions during conference sessions.

Participation in international exchanges can take substantial time, and time is a critical factor for successful exchanges (World Bank, 2014). It is not only about time to take part in exchange events, but also about time for preparation and follow up. Staff members who take part in international activities are usually among the most competent and talented, and they are involved in many domestic tasks and projects. It seems, however, that only a few respondents perceive time as a constraint in the exchanges. They find it difficult to set aside enough time before and after international meetings and other events as expressed by this participant:

(P8) "The problem is to find time, particularly after international events. For example when I have been to the x conference, there are so many things I would like have a closer look at when I get back. But there is no time for this since I have a very busy job. ... I believe that the road administration would benefit more from my international participation if more time was set aside for this."

For most participants, however, it is seemingly a question of adjusting the time spent on international activities to other work duties and commitments. There are respondents who express a wish to increase the activities, such as in the case, indicating that there is no shortage of time:

(P4) "But I think, however, that we should be allowed to attend more conferences abroad."

International cooperation involves international travelling, and the organisation should ensure easy procedures of approving trips abroad that do not hamper the cooperation. While most respondents appear to be satisfied with the international travelling arrangement, a few of them feel frustrated because of the time it takes to get their managers' approval for travelling. It seems, however, that in such instances, the procedures are not followed. Despite being isolated cases, one should be aware that slow travel approval processes easily can demotivate employees to take part in international activities.

Summary of key findings from interviews:

- There is some dissatisfaction among interviewees about the current practice of appointing participants, since it is not consistently based on professional qualifications and responsibilities. The selection process also seems to lack transparency.
- The shared learning experience from going on study tours and attending conferences with colleagues is appreciated. As concerns participation in international groups and projects, a team of colleagues rather than individuals should be involved in order to foster collective learning.
- Many participants appear not to take full advantage of attending international conferences. This is seemingly due to inadequate planning and preparations of conference attendance and to the participants' preferences for exchanging knowledge.
- The organisation does not appear to gain maximum benefit from conference attendance due to lack of structured sharing arrangements before, during, and after attendance.
- Time constraints do not seem to be a major problem for most participants.

5.3.2 Responses to interview findings

Issues of discussion in focus groups and with individuals:

- How the organisation better can facilitate exchanges: criteria for selection of participants, participation in international groups and projects with teams rather than with individuals, planning and preparations of conference attendance, and time available for exchanges

Focus groups with interviewees

The focus groups consolidate the findings from interviews. The selection of participants to international activities appears to be an important issue to most respondents. Today, the appointment of employees to take part in the various activities is perceived to be somewhat incidental, and attendance at international conferences creates particular frustration. Many respondents disagree with what they perceive as current practice, notably to use conference attendance as a way of rewarding employees for hard work.

The participants would welcome more transparent selection processes that emphasise participants' qualifications and functions, and availability to partake in exchanges. As concerns availability, the respondents confirm that they largely manage their own time, and it is up to them to set aside the time needed for international activities. At the same time, the organisation should ensure that employees do not take on too many tasks.

As concerns the issue of teamwork rather than individual work in the participation in international groups and projects, the participants are unanimously in favour of changing the current practice. Preferably, there should be at least two people from the organisation taking part in such groups and projects, and they should have a group of colleagues at home to act as discussion partners. Such groups of colleagues can be made up of existing units and networks. This approach has several advantages, such as making the participants feel less alone, engaging more people in the activities, easing the introduction of new knowledge in the home organisation, and making the organisation less vulnerable to staff turnovers. The teamwork approach will naturally require more resources, but the resource use is likely to be justified in terms of increased learning and benefits of taking part in the activities.

It becomes clear that conference attendance can be a mixed experience in terms of learning. Many participants confirm that it is not their preferred method, but at the same time, they find conferences to be useful provided that there are topics of relevance for their work. They agree that more efforts need to be put into the planning and preparations of conference attendance, but they also experience that even if the programme looks promising, the quality and relevance of sessions vary.

The discussions in focus groups confirm the findings of interviews. The problems regarding the facilitation of partaking in exchanges are connected to the issues of who to take part and how to take part.

Focus groups and individual discussions with non-interviewees

This theme deals with conditions within the home organisation of the interviewees, and it is therefore of interest to compare responses from people within the organisation (internal) with those of people from organisations abroad (external).

Regarding selection of participants, both internal and external people recognise that the selection process is important because many employees want to get involved, and it can be challenging to find the most suitable participants. Several internal people find that the current selection criteria are relevant, but they should be made more explicit. They also agree that the selection process should be more open. Like interviewees, internal people see a problem in the use of conference attendance as bonus for hard work, which is not in accordance with the criteria. External people, on their side, appear to be less preoccupied with selection criteria and processes, and it is not common to have written procedures. Some of them seem, however, to acknowledge a need for more formalised and open processes in order to reduce frustration and hostility among staff members. In addition to professional suitability, many external people emphasise that motivation and dedication are important selection criteria.

When it comes to participation in international groups and projects, organisations seem to share the practice of appointing only one participant. The idea of involving teams rather than individuals finds general support among internal and external people. Most respondents clearly see a need for enhancing the collective and organisational learning from such exchanges. A few internal and external people are sceptical to the idea because of budgetary implications. However, as expressed by some other people, in the case of

budget restrictions, it is a matter of balancing quality and quantity, and it can be more beneficial to involve many people in a few groups than only one person in many groups.

There is a striking difference in opinions on conference attendance between internal and external people. While the majority of internal people largely share the views of the interviewees, most external people do not see any particular problems with regard to conferences. There can be several reasons for this difference, but it appears that conference attendance is more restricted in other organisations and needs better justification in terms of expected benefits.

In summary, people within the organisation largely consolidate findings from interviews, while there are both similar and different views among professionals abroad. This is not surprising given that organisations in different countries facilitate their international participation in different ways.

5.3.3 Potential for improvement

There is a potential for improving the facilitation of exchanges by the organisation as concerns selection of exchange participants, fostering of collective (team) learning in the organisation, and conference attendance.

- **Successful exchanges depend largely on the participants, and they should be selected based on professional qualifications, responsibilities, and availability. In addition to clear selection criteria, the selection process needs to be transparent in order to gain acceptance among employees.**
- **To foster collective learning and increase individual and organisational impact of participation in international groups and projects, a team of colleagues should be involved rather than only one person.**
- **As regards attendance at international conferences, the organisation and prospective attendees need to assess carefully the relevance of conference topics in order to match expected benefits.**
- **More information can be gathered from conferences, without any budgetary implications, with structured and modern sharing arrangements among colleagues before, during, and after attendance. Such arrangements include proxy information gathering and use of social media (Twitter) during conferences.**

5.4 Interactions in multicultural settings

5.4.1 Interview findings

Interaction and communication across countries and cultures involves specific challenges. According to Adler (1991), the greater the differences between cultures, the greater the chance of cross-cultural miscommunication. In knowledge exchanges, Riege (2005) has identified differences in national culture, ethnic background, and language as important barriers.

It seems that language is the major obstacle experienced by the participants. Using a second language is a less means of communication compared to one's native language and lacking language proficiency makes it harder to understand each other. Most interviewees feel that using English as working language is challenging, and in some cases, it prevents them from fully benefitting from the activities. The problem arises because of their own lack of English proficiency, other people's lack of English proficiency, or both. This quote illustrates the problem:

(P7) "The main problem is language, and the use of English is a barrier for me. I can read and write without problems, but I do not speak English as fluently as I should. When I discuss with other people who are not fluent in English either, we do not get a clear understanding of what is said."

When language interpretation is used, it slows the pace of exchanges. A few interviewees find simultaneous translation between English and a third language in meetings to be time-consuming and tiresome, and thereby constraining the discussions.

It is imperative that participants in international cooperation possess good English skills, and this is a requirement by the organisation as shown in section 3.4.4. According to Lewis (2006), language proficiency forms an essential part of being cross-culturally competent. The sample demonstrates the significance of language for effective communication and a need for improving English skills of participants in international exchanges.

In addition to language, participants experience barriers that seem to be rooted in different cultural styles. When participants in exchanges originate from different national and organisational cultures, it becomes difficult to establish a common frame of reference and

understanding of the topics of discussion. According to Adler (1991), culture strongly influences people's interpretations of what they hear and see. Subconscious cultural blinders, lack of cultural self-awareness, projected similarity, and parochialism often cause misinterpretations. Interviewees experience greater cultural clashes when the countries represented in exchanges are at different stages of development and have very different needs. In the field of road transport, experience shows that technological maturity of nations can significantly affect knowledge exchanges (Transportation Research Center, 1992).

Attitudes also seem to influence the exchanges. Different attitudes towards time and deadlines cause frustrations as illustrated in this case:

(P6) "We have also different attitudes when it comes to time and deadlines. There are countries that always deliver their contributions in time, while others deliver with delays, if at all."

It is clear that different time orientations hamper the work in international groups and projects that depends on timely contributions by all members. Some respondents have also experienced different attitudes towards exchanging knowledge. Professionals from other countries can be selective as regards what knowledge to share and appear to be more eager to take than to give.

Attitudes, along with behavioural norms and beliefs, are rooted in the culture, although they can be influenced by individual personality (Adler, 1991). In addition to culture-related barriers, individual personality affects exchanges. A few respondents state that discussions are often constrained by dominating persons or by introverted and reserved persons. For some people, it takes time and efforts to feel confident and develop trust in an international group, such as this quote illustrates:

(P17) "Some members are very reserved in the beginning, but once you get to know them, they become more open and talk about the problems and challenges they face. In the late evenings, they tell you the true story."

Experience in the road transport sector shows that mistrust between partners can seriously constrain international exchanges (Transportation Research Center, 1992).

Another problem faced by several respondents is non-attendance in meetings by other members of international groups. Absence of members hampers the continuity and

progress of the group work. This problem has apparently little to do with culture and personality, but rather with budgetary and/or time constraints. It is a matter of fact that travelling abroad is restricted in some countries because of small or austerity budgets. This finding confirms the significance of participants' availability referred to in the previous theme.

The interviewees seem to pay attention to cultural differences to a varying extent. Some respondents emphasise the importance of exercising sociocultural understanding and skills in international interactions. As expressed by this participant:

(P11) "What is important in this connection is to be aware of differences, show respect, and be polite and humble."

While most respondents appear to face problems in multicultural interactions, a few respondents do not see cultural differences as a problem. According to Lewis (2006), people tend to minimise or ignore cultural differences if they lack cross-cultural competence. Awareness of cultural differences and personal experience are required to develop cross-cultural competence (Lewis, 2006).

The sample demonstrates that communication difficulties across cultures are not only due to language barriers, but also to different cultural ethnicity and background. Participants may also hold a different worldview that by itself makes it hard to communicate and develop a shared understanding. Communication across cultures requires being aware of differences because what is considered acceptable and natural in one culture can be confusing or even offensive in another. In addition to tactful and sensitive conduct, it is necessary for participants to understand the social and cultural contexts of the knowledge and experience found abroad. Technologies and solutions of others usually need to be adapted for utilisation in a new context or may not be applicable at all.

In the previous theme, I find that criteria for selecting participants in exchanges should include their professional qualifications, responsibilities, and availability. According to findings in this theme, it is reasonable to place more emphasis on English skills in the selection. Participants should in addition be willing to take part in English language training as needed and to be sensitised to cross-cultural issues.

Given the obstacles encountered in multicultural settings, it is perhaps not surprising to find that cooperation with neighbouring countries is most appreciated. Many interviewees state that they learn most from colleagues in other Nordic countries, such as this one:

(P15) “The most useful experience has been to participate in Nordic working groups. ... The Nordic countries have many similar challenges, and we speak more or less the same language.”

I should add to this that these interviewees also have experience from knowledge exchange outside of the Nordic region. The preference for regional cooperation, however, is not only about similarities in language and culture. The Nordic countries also have quite similar natural geographic and climatic conditions that influence the road transport sector. Regarding language, it should be noted that Nordic cooperation sometimes requires use of English when participants from outside of Scandinavia are involved. This is demonstrated in the NVF process presented in appendix 1.

The theoretical models for cross-cultural communication of Hall, Hofstede, Trompenaars and Hampden-Turner, and Lewis described in section 3.2.3, consider Nordic countries as culturally similar. They share cultural dimensions and value orientations described in the models. By way of example, the cultures are predominantly monochronic (Hall, 1959 and 1969) and linear-active (Lewis, 2006); cultures that are highly organised and where tasks are handled sequentially.

Summary of key findings from interviews:

- Language appears to be an important and most frequently expressed barrier in multicultural settings, and there are interviewees who lack adequate English proficiency.
- Other challenges are rooted in different cultural styles, worldview, and individual personality. Interviewees pay attention to such differences to a varying extent.
- Apparently, the challenges in multicultural settings give rise to a preference for cooperation within the same geographic region.

5.4.2 Responses to interview findings

Issues of discussion in focus groups and with individuals:

- Whether language is a bigger constraint in international interactions than other cultural differences and lack of sociocultural understanding
- Whether Nordic (regional) cooperation is more useful than cooperation in European and global forums

Focus groups with interviewees

The discussions provide slightly different and more elaborate views on the interactions between different cultures and countries. The participants confirm that the use of English is a significant challenge, but this is mainly due to lack of English skills of participants from other countries. Some participants still find their own lack of English proficiency to be a constraint.

Although most participants admit that cultural diversity can be challenging, they also find it interesting. When people with different cultural background and worldview engage in a discussion, they can provide each other with new and very different perspectives and ideas that generate new insights and understanding of one's own situation.

From the individual interviews, I find that participants tend to appreciate cooperation in Nordic forums more than European and global forums. The focus group discussions give a more balanced picture on knowledge exchange forums and partners. Clearly, it is easier to exchange knowledge in one's native language with people working under similar conditions, facing similar challenges, and thinking alike. However, the fact that Nordic cooperation is easier does not necessarily mean that it is more useful.

Several interviewees point out that there are certain fields of work, such as winter services, where cooperation with other Nordic countries is the natural choice. In other fields, for example bridges, considerable knowledge can be found in Southeast Asia. The kind of knowledge needed appears to matter more than language and cultural differences in the choice of partners and forums for cooperation. This attunes with the finding in the first theme indicating that knowledge needs are the most important factor also for the choice of exchange methods.

The experience of many participants is that Nordic cooperation usually has a practical approach, and it is very useful for learning about concrete solutions to problems. If the purpose is to broaden the perspectives and get new ideas, there is usually more to learn outside of the Nordic region. Another related aspect is the people acting in different places and forums. In Nordic cooperation, one usually meets practitioners of similar organisations, while it is more common in European and global forums to meet also decision-makers and researchers with a more theoretical approach to the issues of discussion.

Focus groups and individual discussions with non-interviewees

The views and experience of non-interviewees from both within and outside of the organisation largely consolidate those of the interviewees. A number of barriers experienced in knowledge exchanges seem to be caused by sociocultural conditions, including language, different cultural and ethnic background, sociological differences (superiority-inferiority), and different attitudes. Communication problems further arise when people hold different worldview and values.

Language is often a major problem. When it is very critical for the partners to fully understand each other, some organisations abroad overcome the language problem by using interpreters. It is interesting to find that language challenges can exist even between various forms of English (British, American, Australian, and African), since people use different technical terminology.

Responses further emphasise the importance of contextual understanding and the need for participants in exchanges to understand both their own context and that of others. Many respondents both from within and outside of the organisation stress the importance of being aware of different cultural and social norms including rank, hierarchy, and gender. It is generally recognised that participants have to be sensitive to cultural diversity.

When it comes to the issue of identifying appropriate knowledge exchange forums and partners, it is the experience of many respondents that hard-core technologies can be adapted from everywhere, since sociocultural factors do not matter significantly. As regards soft issues, such as work practices, they require more cultural similarity. The question of regional versus global cooperation is thus a matter of what knowledge is needed. Although interactions are easier with countries similar to one's own, language and cultural challenges should not prevent exchanges with very different cultures.

5.4.3 Potential for improvement

Knowledge needs should guide the selection of partners and forums for cooperation, and participants have to cope with cultures that are both similar and different from their own. In order to increase the benefits of exchanges, it is important that they possess a good command of spoken and written English and are cross-culturally competent.

- The organisation should search more carefully for partners and forums of cooperation to make sure they match the knowledge needs.
- English skills should be considered in the selection of participants along with their professional qualifications, responsibilities, and availability. Participants should be prepared for improving their English through training when needed.
- The organisation should provide for cross-cultural training in order to raise awareness of cultural diversity and for the participants to develop cultural sensitivity.

5.5 Introduction of new knowledge in the organisation

5.5.1 Interview findings

For a knowledge exchange to be successful, the knowledge acquired by the participants has to translate into application. Sharing and integration of the knowledge in the home environment is the first step to that end. As described in section 3.4.4, the participants are expected to share and disseminate what they learn abroad within the organisation and their professional community. The supervisors of participants are responsible for ensuring and facilitating the sharing and dissemination of foreign knowledge.

The sample gives insights into the participants' sharing practices and preferences, and factors that hamper the sharing. It appears that the sharing is largely self-organised taking the form of informal talks and discussions while working on daily tasks. As expressed by this participant:

(P14) "I do it while carrying out my tasks since I have a function in which I can make use of what I learn from my international work."

Respondents take part in internal networks, and these networks seem to have a positive influence on the sharing between various parts of the organisation. According to Rolland and Kaminska-Labbé (2008), such networks are important for sharing of knowledge across organisational units.

Sharing in more organised forms takes place to a lesser extent. Formal oral sharing occurs at internal staff meetings and project meetings as illustrated in this case:

(P17) "I share and disseminate information and outcomes in staff meetings and in project meetings. My supervisor expects that I actively share and disseminate my knowledge. I have a role as adviser in several x-projects, and project staff frequently ask me for advice."

Some interviewees give presentations at internal and external seminars and conferences in which they include knowledge from abroad.

Sharing in writing appears to be rare with the exception of the reports required from study tours. No one prepares reports, like progress and final reports, from their international activities. Obviously, their supervisors do not request written reporting. A few interviewees state that they usually distribute reports, papers, and other documents from international groups and projects, conferences, etc. to colleagues who they think are interested, or at least should be interested. As most written materials are now available in digital format, distribution to colleagues has become easier. Sharing of knowledge with colleagues is a continuous process rather than a one-off action. As discussed in the second theme, colleagues should be involved from the beginning. Employees who just receive documents from international events without prior involvement and request are not likely to engage themselves in the new knowledge to the same extent as if they were already involved in the process.

The sharing practices and preferences emphasise social interaction, and this may indicate a dominance of tacit knowledge sharing. As shown in the SECI model of Nonaka and Takeuchi (1995), sharing of tacit knowledge takes place in the model's socialisation process involving dialogue and interaction. Sharing mechanisms can according to Chai (2010), have high reach (written materials) or high richness (face-to-face interactions). Participants seem to apply mostly high richness mechanisms that are appropriate for sharing tacit knowledge.

Most respondents prefer oral sharing to written sharing apparently because of personal contact and immediate responses. As stated by this one:

(P9) "I believe oral forms of sharing are better than written forms – it is much easier to talk with people and it is easier for people to contact me later. I am not a great fan of information banks and such formalised systems."

While most sharing takes informal forms, many interviewees would welcome more organised events, such as seminars and information sessions, in which they can share and

disseminate more formally. Some participants are further concerned about the use of time and prefer easy forms of sharing, as illustrated in this case:

(P1) "The sharing and dissemination should take place in simple ways, for instance through presentations that do not require extensive preparations. They need to be relatively short so people can find time to attend."

Only a few interviewees emphasise that documentation of work done is important and would prefer more written forms of sharing. Written sharing can be through activity reports and a forum, internal magazine, and newsletters on the organisation's intranet. Another aspect of written sharing is that it makes the participants reflect more on their learning as illustrated in this case:

(P5) "I believe written reporting should be required to make it easier for colleagues to make use of what we bring back. ... This will make me reflect more on how things work and what I get out of it."

The dominant preference for social interaction and tacit knowledge sharing accords with what is found in the first theme about ways of exchanging knowledge in international settings. While international exchanges are hampered by language and cultural differences as shown in the third theme, knowledge sharing with colleagues in the home organisation faces different challenges.

It seems that some participants do not share their learning from abroad as widely as they ought to do and that they are constrained by both individual and organisational conditions. Time and attitudes appear to be important individual factors. Many respondents admit that they could have spent more of their time on sharing knowledge. One participant puts it in this way:

(P4) "I should spend more time on this. The problem is that it is quite hectic at work, and I sometimes forget to share and disseminate information that can be of use to others."

As discussed in the second theme about the facilitation of exchanges, participants largely manage their own time, and lack of time is not a significant problem in international exchanges. While taking part in exchanges abroad is seemingly stimulating and rewarding, sharing knowledge with colleagues at home appears to be a less attractive activity. Statements like this one indicate an attitude problem:

(P1) "I think that sharing and dissemination is, to some extent, considered as a burden."

The question of finding time is often a question of prioritising, and people tend to prioritise what they find most interesting. Conflicting demands and time constraints may cause them to make compromises, and if they find it too time-consuming and cumbersome to share knowledge with colleagues, they end up limiting or avoiding it. Research on intra-organisational knowledge sharing has identified time constraints and attitudes as important individual barriers (Yu et al., 2003; Riege, 2005; Sandhu et al., 2011).

Organisational factors that seem to influence sharing are lack of formal sharing schemes and support from managers and colleagues. While a few participants appear to appreciate the current practices that render them flexibility, most participants would share more if there were more procedures and organised events for sharing put in place. As stated by this participant:

(P3) "We are not good enough at sharing and disseminating results. We often use time pressure as an excuse, but I think it has more to do with not knowing how to do it and in which forms it should take place."

The lack of support and encouragement is clearly illustrated in this case:

(P6) "I take part in many international projects that concern the work of my colleagues, and I am very eager to provide them with information and to tell them about my experience. But sometimes I feel they are not interested in what I want to share with them, and particularly managers."

Research shows that lack of support from managers and colleagues is one of the most important organisational barriers for knowledge sharing in organisations (Cabrera et al., 2006; Rivera-Vazquez et al., 2009; McNichols, 2010; Amayah, 2013).

The apparent lack of organisational support refers back to the discussion in the second theme (facilitation of exchanges) about involving a team of colleagues in exchanges rather than individuals. It would most probably be easier to introduce new knowledge into the organisation if more than one participant was involved in an international exchange.

As stated by Wellman (2009), there are different perspectives on knowledge management: a technology perspective, an organisational structure perspective, and an environmental perspective. The interviews show that participants emphasise the environment and

organisational structure in their knowledge sharing and that technology (ICTs) plays a minor role. Several studies stress that the social environment and individual factors are more important than the use of ICTs for employees to share knowledge (Davenport and Prusak, 2000; Cabrera and Cabrera, 2002; Newell et al., 2002; von Krogh et al., 2006).

The findings give reason to build on the existing sharing culture and use of existing meetings and networks for more formal sharing facilitation. While the organisation can benefit from more structured sharing arrangements, it will still be important to maintain and encourage the spontaneous sharing that takes place in informal settings.

In addition to the issue of sharing knowledge from abroad, adapting foreign knowledge to fit the organisation's needs and context is an issue of concern among many interviewees. As expressed by this participant:

(P12) "It is very important to consider the use of technologies in a societal context and to understand that one cannot transfer technologies directly from one place to another."

Respondents also seem to be aware of the time it takes to adapt new knowledge to the specific conditions in the organisation, as illustrated by this one:

(P10) "In my case, it takes time before the organisation can make use of the outcomes of my international activities."

The discussion in the previous theme about multicultural exchanges highlights the importance of contextual understanding. It is the experience from knowledge exchanges in the road transport sector that very few methods and techniques are directly transferable between nations. There are differences in socioeconomic and sociocultural factors, availability of financial and human resources, materials, equipment, etc. (Transportation Research Center, 1992). Also within development cooperation, the need for adapting foreign knowledge to suit local contexts and needs is recognised (Stiglitz, 2000; Denning, 2002; World Bank, 2011b).

The sample further suggests that a participant holding a key position and/or particular competencies can more easily introduce new solutions and change ways of working. As one participant states:

(P8) "I find that the outcomes to a large extent are applied, and that is because I have been in a position where I could take care of the implementation myself."

Experience from both the professional field (Federal Highway Administration, 2015) and development cooperation (Korea Development Institute and World Bank, 2011; World Bank, 2013) demonstrates the importance of involving influential participants. The role of exchange participants can be seen as an analogue to that of knowledge activists in the model of von Krogh et al. (2006) referred to in section 3.2.4. To judge from the sample, there are participants who apparently do not perceive themselves as such catalysts to any noticeable extent. It is clear that a successful knowledge exchange requires participants who are able to initiate and influence developments and changes, and it seems that this factor has not been sufficiently taken into account in the appointment process. Findings of the second and third themes indicate that professional qualifications, responsibilities, availability, and language proficiency are important selection criteria. In addition to these criteria, the selection also needs to place more emphasis on participants' influential abilities.

Summary of key findings from interviews:

- The sharing of new knowledge in the organisation is largely self-organised and informal, and occurs mainly when participants carry out their ordinary tasks and socialise in networks.
- Sharing practices and preferences emphasise dialogue and social interaction allowing tacit knowledge sharing, and participants would like to have more organised arrangements where they can present and discuss knowledge acquired abroad.
- The knowledge sharing is constrained by both individual factors (time and attitudes) and organisational factors (lack of formal sharing schemes and support from colleagues and managers).
- The participants perceive themselves as catalysts to initiate and influence organisational developments and changes to a varying extent.

5.5.2 Responses to interview findings

Issues of discussion in focus groups and with individuals:

- Conditions that constrain knowledge sharing within the home organisation: lack of sharing systems and procedures, lack of support from managers and colleagues, lack of motivation, and lack of time

- To what extent the participants look at themselves as catalysts to initiate and influence improvements in policies and practices that result from foreign knowledge

Focus groups with interviewees

These discussions provide slightly different opinions on knowledge sharing constraints. While interview findings indicate some reluctance to sharing knowledge from international activities within the organisation, this does not seem to be an important constraint according to the focus groups. Most participants state that they are willing and motivated to share more than what they do today. They feel being part of a cooperative working environment and an organisational culture that encourages knowledge sharing. The majority of respondents think, however, that they are not good enough at sharing and disseminating knowledge with their colleagues and managers.

The participants confirm that the hampering factors in knowledge sharing are lack of formalised procedures, support from the organisation, and time. When it comes to time, many respondents claim that the problem is not only their own lack of time, but also lack of time of their colleagues and managers. Although there are instances of lack of others' commitment and interest, many participants perceive the lack of other people's time to be a problem too.

The discussions further confirm that most participants are in favour of some kind of schemes and procedures to increase the knowledge sharing. Such sharing schemes should not be too rigid, but allow for some flexibility. The participants emphasise that there is no need to set up new forums and events for sharing; it should take place within existing meetings and networks.

To judge from the discussions on the participants' role as catalyst, it seems that some of them are not fully aware of this role, although they appear to be acting in it. The role and responsibility of participants in initiating developments and changes appears not to be sufficiently emphasised by the organisation. Most respondents agree that the capacity to act as catalyst should form part of the participant selection criteria.

Focus groups and individual discussions with non-interviewees

The discussions show that everyone faces the challenge of bringing foreign knowledge back to the home organisation. Respondents generally recognise an enabling working

environment as important for knowledge sharing and stress the responsibility of managers for ensuring a cooperative culture and organisational structures that create good relationships and trust in the organisation.

One would expect knowledge sharing constraints to vary between organisations, since every organisation is unique, but this is not always the case. People from within the organisation and abroad largely agree on what are the constraining factors. Most of them share the opinion of interviewees that there is a need for strong involvement by managers and colleagues in the integration process. However, according to several respondents, this is not a widespread problem, since there are many examples of managers and colleagues who are clearly committed to and engaged in the international activities of their co-workers.

Many respondents further believe that some kind of formalisation and structure enables more knowledge sharing. When it comes to forms of sharing and dissemination, however, there are different views. Some people believe written forms of sharing are important in addition to oral forms in order to make the knowledge available to as many people as possible. Other people are in favour of oral sharing only as they find that few people read that kind of reports. It appears that a few organisations abroad have strict reporting requirements for all kinds of international activities, while most organisations require written reporting only for certain activities.

Concerning participants' role as catalysts to promote developments and changes in their home organisation, everyone believes that this is an essential part of being an exchange participant. Organisations seem, however, to differ in the extent to which they stress this role. While this role is highly emphasised in some organisations, it is less articulated in others.

5.5.3 Potential for improvement

There are measures to be taken by everyone concerned – managers, colleagues, and participants – with the view to improve the introduction of new knowledge in the organisation.

- **The organisation should facilitate more formal sharing schemes by making use of existing meetings, networks, information sessions, and seminars.**

- **Managers and colleagues of participants need to take a more active part in the introduction of foreign knowledge.**
- **Participants' capacity to initiate, influence, and drive developments and changes in the home organisation needs to form part of the selection criteria in addition to professional qualifications, responsibilities, availability, and language proficiency.**

5.6 The receiving environment

5.6.1 Interview findings

The participants' stories tell something about the reception of foreign knowledge in the home environment and how prepared the organisation is for adapting and applying new knowledge. It is possible to identify both cultural and structural barriers for receiving knowledge from abroad. Presumably, these barriers cause problems with the sharing of new knowledge in the organisation as discussed in the previous theme.

The main cultural barriers seem to be resistance to change and negative attitudes towards foreign knowledge as illustrated in this case:

(P6) "In my professional community I experience some scepticism when it comes to using experience from abroad in our work."

There can be several reasons for people rejecting new knowledge and insights. They might think the knowledge is relevant to some other contexts but not to their own, they might lack regard for the source of knowledge, or they might fail to understand the benefit of the knowledge. Experience from the professional field shows that lack of acceptance of foreign technology and innovations and concerns about the impact on status quo can be a problem (Transportation Research Board, 1995). When improvements are proposed, employees may feel implied criticism for current practice, their security may be threatened, and proposed solutions may seem to generate more work.

It can be difficult to counteract negative attitudes and resistance, but it might be useful to create more awareness in the organisation about the intention of bringing in new knowledge and the expected benefits. As expressed by this participant:

(P3) "The organisation should further communicate more clearly why we engage in international cooperation so that the activities become more accepted in general."

Experience of others shows that it is sometimes necessary to demonstrate the worth of processes and products to convince managers and staff (Transportation Research Board, 1995; World Bank, 2014). Positive attitudes of executives and management support are also found to be crucial for gaining acceptance and overcoming reluctance to change of practice in the organisation (Transportation Research Center, 1992).

In addition to cultural constraints, participants appear to face constraints of more structural character. According to the interviewees, the demand for the knowledge they bring back to the organisation is varied. Some of them experience that there is very little demand, while others experience some demand or high demand. Lack of demand can be rooted in negative attitudes and resistance to change, but also in lack of needs for the knowledge, or little understanding and awareness about why new knowledge is needed.

According to the organisation's policy referred to in section 3.4.4, partaking in international activities is to be based on needs. Experience of others shows that it is imperative to respond to the needs of the partners involved in knowledge exchanges (Korea Development Institute and the World Bank, 2011), and to listen to those who have needs in the workplace and generate needs from the bottom-up (Transportation Research Center, 1992). Despite the organisation's policy, there seems to be a problem of proper needs identification and articulation as expressed by this participant:

(P11) "Today, the activities are somewhat incidental and not as well-grounded as they ought to be."

While knowledge needs are partly unarticulated, many respondents justify their international work by the need for knowledge from abroad, implicitly expressing that the knowledge needed does not exist within the country or the organisation. It is perhaps not surprising that participants regard the knowledge exchange to be of particular importance for their own discipline, such as in this case:

(P1) "These exchanges among countries are extremely useful and also necessary because my field of work is relatively new and the professional community is very small."

Some of them give the impression of regarding the knowledge exchange as an opportunity to learn more and as a source of inspiration, such as this participant:

(P6) "Within my field, there are things to learn in country x, and they apply similar systems and solutions as we do."

The findings indicate that many participants do not know exactly what they are supposed to learn, but they are apparently aware of the existence of knowledge abroad and anticipate that there is something useful to learn. There also seems to exist a kind of notion or fear among respondents that the organisation will not be able to keep abreast of the developments if it does not take part in international activities.

The sample reveals a lack of clearly defined needs for foreign knowledge. Definition of needs should address the needs of the organisation and not those of employees. What the individual employee wants to learn can by itself be of little value, and even counterproductive. Asking employees what they want may create false and unrealistic expectations of getting exactly what they want.

It is reasonable to assume that the lack of proper definition of knowledge needs is connected to other structural barriers that appear to exist. The interviews reveal different opinions on the level of integration and priority of cross-border knowledge exchange in the organisation. Some respondents find international activities to be well integrated into the domestic work, while others complain about a lack of integration. It does not suffice to simply include a list of international activities in work plans of the units as some participants portray the current situation. One participant puts it in this way:

(P8) "There should be a clear link between our priorities at home and the international participation."

In a few cases, the international activities seem to exist outside of the national work, and they are not even included in work plans. The participants concerned feel that their international work has low priority in the organisation. As expressed by one of them:

(P2) "But within the organisation, international work is not a high priority. As an example, the work we do in international forums within my field does not form part of our annual plans or other work plans."

Some interviewees comment upon a lack of strategies of the knowledge exchange within their specific field of work. From these interviews, it appears that the activities usually form

part of annual plans and other work plans, but the plans do not tell what to achieve. In this way, it looks like taking part in international cooperation is an objective in itself.

It becomes obvious that participants do not perceive the receiving environment as favourable as it ought to be. The organisation is not properly prepared for receiving the foreign knowledge because of both cultural and structural factors. Cultural barriers such as attitudes are hard to change, but are likely to change with better structural conditions. According to the findings, structural improvements include definition of knowledge needs, better integration, and higher priority of knowledge exchanges. This calls for better preparations of knowledge exchange initiatives.

Summary of key findings from interviews:

- There are both cultural and structural barriers for receiving knowledge from abroad within the organisation.
- Cultural barriers include resistance to change and negative attitudes towards knowledge from abroad.
- Structural barriers include lack of clearly identified needs for knowledge, and lack of integration and priority of international knowledge exchanges.

5.6.2 Responses to interview findings

Issues of discussion in focus groups and with individuals:

- To what extent the home organisation is prepared to receive knowledge from abroad: attitudes towards knowledge from abroad, demand for knowledge, definition of needs for knowledge, and integration and priority of knowledge exchanges

Focus groups with interviewees

The focus group discussions largely consolidate the problems identified in the interviews. Many interviewees experience some resistance to new methods and technologies within the organisation, but at the same time, they believe some scepticism is sound as ideas and solutions from elsewhere do not necessarily fit in the organisation due to, for instance, incompatibility of standards and materials, or administrative and legal restrictions. In some cases, however, people in the organisation simply hold conservative attitudes and are not open to new or alternative solutions.

The discussions confirm that the international work is not always properly anchored in the organisation and that definition of needs is sometimes missing. This situation seems to cause negative attitudes towards foreign knowledge and lack of demand for the knowledge. At the same, participants emphasise that there are many examples of successful knowledge exchanges. They emphasise that needs for knowledge from abroad should be seen in relation to priority areas at the domestic level and that definition of needs for foreign knowledge should include scanning of existing knowledge within the organisation, since it may not be fully aware of what knowledge employees already possess.

From the discussions, it is possible to distinguish between two kinds of needs. Needs for knowledge can be reactive and based on a particular problem that has to be solved or a priority area in which the organisation has knowledge gaps. If the knowledge needed is not available in the country, one has to look for it abroad. The other kind of need is more proactive and involves an intention to keep pace with the developments and find out if there is something to learn from other countries.

Focus groups and individual discussions with non-interviewees

As in the second theme about facilitation of exchanges, this theme also deals with issues that are specific to the home environment of the interviewees. How new knowledge from abroad is received depends on the specific conditions of the individual organisation, and one would therefore expect responses from people within the organisation (internal) to be different from those from people of various organisations abroad (external).

In general, internal people recognise cultural and structural problems with the reception of foreign knowledge in the organisation, but they described the cultural conditions in more positive terms than what interviewees do. According to internal respondents, many employees of the organisation are open-minded and curious to learn from other countries. They admit, however, that there are negative and ignorant attitudes as well. As concerns structural factors, internal people seem largely to agree with interview findings. Many of them are particularly concerned about the lack of integration of international activities into plans and priorities at the domestic level. Several respondents also find it necessary to provide better justification of some international activities, and to base the engagement abroad on better needs definition.

External respondents appear to be familiar with the conditions identified in the interviews. Naturally, the receiving environment varies between organisations, both with regard to cultural and structural factors. As regards culture, it seems commonplace to find resistance to foreign knowledge and change of practice in organisations. Some organisations are clearly less open and receptive to new ideas and solutions than others. There is sometimes little willingness to test new methods and technologies in the home environment.

Several external respondents stress that it may take considerable time to adapt and apply new knowledge due to structural factors. Appraisals of applicability often involve practical testing and demonstration, and sometimes more research. It can also be necessary to change or modify existing regulations. The appraisals may even conclude that the knowledge does not suit the specific needs of the organisation. Another important factor pointed out by some respondents is that introduction of a new procedure, practice, or method will sometimes require changes outside of the organisation, for instance in the construction industry or in the parent ministry.

5.6.3 Potential for improvement

There is obviously a potential for improving results by better needs definition and anchoring of international knowledge exchanges in the organisation's goals. Cultural barriers are hard to change, but they can be reduced by improving structural conditions.

- **Needs of the organisation for foreign knowledge should be clearly defined for all knowledge exchange initiatives.**
- **Knowledge exchanges should be anchored in organisational goals in order to increase the acceptance and demand for knowledge from abroad.**

5.7 Benefits of knowledge exchange

5.7.1 Interview findings

The interviews indicate how the respondents perceive the impact on them as individuals and on the organisation. As outlined in section 3.4.4, the organisation's policy states that international activities should be needs-based and goal-oriented and develop individual and organisational capacity. In the capacity development perspective of the United Nations

Committee of Experts on Public Administration (2006), the individual (participant) results can be regarded as intermediate results to the organisation's knowledge exchange results. The participants' capacity development should translate, over time, into organisational capacity development.

As regards individual benefits, the responses indicate that participants have benefitted from their international engagement to a varying extent and in different ways. They all seem to be of the opinion that they have grown professionally as a result of the international exchanges. According to their statements, the professional growth takes the forms of expansion of knowledge base, acquisition of more know-how, development of new ideas and perspectives, and a broader understanding of their professional field. Some interviewees are very positive about their own benefits, such as this one:

(P14) "My best experience is that I have expanded my knowledge base."

Others are more modest when they speak of professional impact. Their engagement abroad seems simply to have enabled them to keep pace with the developments internationally within their field. One participant puts it in this way:

(P10) "It has meant that I have not stagnated. It is important for me to know where I stand in my field."

In addition to professional growth, some participants appear to have experienced personal development. By taking part in international activities, they seemingly feel more important and influential as professionals, their self-confidence and self-efficacy have increased, and their attitudes have changed. The professional and personal development is demonstrated in this example:

(P8) "It has given me new knowledge within my field and made me more self-confident and open-minded."

Another individual benefit of the exchanges appears to be enhanced cross-cultural understanding and skills. Some interviewees state that they have gained a better grasp of the sociocultural context in other countries and the importance of understanding the context of technologies. They further feel they have learned more about how to perform and behave in international settings, and improved English skills have made them better prepared for taking part in discussions with professionals from abroad. According to Lewis (2006), it requires substantial international experience to develop cross-cultural

competence and sensitivity, but to judge from the sample, other factors, such as personality, seem to play a role in the development of cross-cultural skills in addition to international experience. In the sample, there is no clear correspondence between international experience and appreciation of cross-cultural competence development.

While the above benefits are direct, the findings further reveal some benefits that are more indirect in nature. Some respondents give the impression that the knowledge exchange has resulted in increased job satisfaction. They appreciate the opportunity to work internationally, and they regard the activities as a source of inspiration and motivation for doing a better job. Some of them expose a special interest for other cultures, and the knowledge exchange adds an extra cultural dimension to their job. One case clearly illustrates that the opportunities for international work is a reason for staying with the organisation:

(P12) "That is one of the reasons why I work for the road administration. I started working in the organisation on a temporary contract, and my plan was to return to a private company when the contract expired. But I found that there were many opportunities here, both nationally and internationally, and I decided to stay."

This statement aligns with the finding in the study by Salskov-Iversen (2006) about the importance of international activities for recruiting and retaining employees. The interview findings further include a few cases where the international experience of the participants has influenced their career development and contributed to promotion to a senior level position.

It is not surprising to find that the participants' engagement in knowledge exchanges is driven largely by the opportunity for professional learning and development as this is the intended major benefit. The World Road Association (2014) survey also shows that increased professional knowledge is the main driver for participation. More than 80 percent of the survey respondents believe that international participation will contribute to professional growth, while some 40 percent think it will contribute to improved job performance and career advancement. At the same time, the interview findings indicate that there are additional personal and value-oriented benefits that should not be underestimated, as they seem to increase the inspiration and motivation to participate.

While the returns of exchanges at the individual level appear to be substantial, the returns to the organisation are seemingly more varied. The intended capacity development at the

organisational level should be reflected in the application of the knowledge from abroad. New knowledge is applied when a change in policy, standards, guidelines, or practice occurs. The sample shows great variations in this regard.

There are a few alarming cases where the respondents claim there is little demand for their knowledge in the organisation. This may indicate that the knowledge exchange is not based on actual needs and/or sharing of knowledge in the organisation is lacking. Some interviewees give the impression of using their knowledge only implicitly in their daily tasks and being the only user of the knowledge. It is difficult to observe any tangible results of their international work. This example illustrates the situation:

(P4) "I do not think the organisation can see any concrete results. But I use, of course, the knowledge I have acquired abroad in my job at home. In this way, the organisation benefits indirectly from my work."

The perception of many participants, however, is that the knowledge from abroad is useful and largely applied in the organisation. According to their statements, the knowledge serves as input in the organisation's strategic planning development, various development projects and programmes, in development of methods and systems, and in development and revisions of handbooks and guidelines. In these cases, the new knowledge is made explicit and there are tangible returns to the organisation. As expressed by this participant:

(P16) "Our research and development activities and the implementation of new methods and techniques are to a large extent influenced and inspired by what is going on abroad and by our cooperation with other countries."

In some cases, the knowledge exchange has been initiated based on specific and pressing needs of the organisation, such as in this case:

(P8) "The x road administration had already experienced the same problem, and they had developed a particular method that we adapted to our needs. This method was vital for being able to xxx, and we still use it."

This case clearly demonstrates that knowledge exchange, when based on concrete needs, can be cost-effective in terms of using knowledge and experience of others without having to reinvent the wheel.

Although there are many examples of exchanges resulting in changes and improvements in policies and practices, the organisation does not seem to take full advantage of the

international engagement. Individual capacity development does not always appear to translate into organisational capacity development to the extent it ought to do. In previous themes, several constraints in the knowledge exchange process are identified. It is reasonable to believe that by reducing or removing these constraints and adopting a more results-oriented approach, the knowledge exchange results of the organisation are likely to increase. Experience of others shows that successful knowledge exchanges require results orientation (World Bank, 2011b; World Bank, 2013 and 2014). The reported success of the U.S. international scanning programme can largely be attributed to its strong focus on implementation of foreign technologies (Federal Highway Administration, 2015).

Some interviewees indicate that it can be difficult to justify the international activities because there is no system in place to assess and demonstrate results. The organisation invests considerable resources in international exchanges, and the actual returns to the organisation in the form of increased capacities and improved performance are not always known, and accordingly, hard to show. It therefore seems appropriate to introduce a system for monitoring of progress and assessment and demonstration of results. The defined knowledge needs should form the foundation in such a system.

In addition to benefits related to capacity development, the sample indicates that there are benefits related to the aspects of social responsibility and ethics too. A few respondents mention the moral obligations and social and ethical values of international cooperation. As expressed by this interviewee:

(P15) "It is a pleasure to see that other countries adapt our solutions within xxx."

The issues of social responsibility and international solidarity are important social and ethical values of an internationally oriented organisation, and such concerns contribute to creating and maintaining a good standing of the organisation both nationally and internationally.

Summary of key findings from interviews:

- There is substantial capacity development taking place at the individual level (intermediate results).
- Due to constraints in the knowledge exchange process identified in previous themes, the individual capacity development does not fully translate into capacity development at the organisational level (knowledge exchange results).

- It is hard to know and show the results, since there is no system in place to monitor progress and to assess and demonstrate results.

5.7.2 Responses to interview findings

Issue of discussion in focus groups and with individuals:

- How to know and show results of exchanges

Focus groups with interviewees

The focus group discussions largely confirm that the organisation should have a stronger focus on results and be better able to know and show results of exchanges. Several participants point out that there are tangible results, such as a new method, of which one can easily trace the sources of knowledge and provide evidence of the value of international exchanges. In other cases, the outcomes are more intangible, such as a changed practice, of which it is harder to trace the knowledge sources. A new practice is usually shaped over time and influenced by various factors.

Most participants see a need for introducing measures to assess and demonstrate results. A concrete measure to that end would be to include knowledge and literature sources in the organisation's strategic and operational documents, such as plans, guidelines, handbooks, etc. Many of these documents are partly based on knowledge acquired from other countries, but the knowledge sources are rarely acknowledged.

From the discussions, it appears that interviewees are not in favour of a complicated measurement system. A viable option for assessing and demonstrating results could be to rely on participants' self-evaluation. Participants' accounts and reflections on the results should be shared and discussed within the organisation.

Focus groups and individual discussions with non-interviewees

From the discussions with people from within the organisation, it is clear that in order to gain wider acceptance of knowledge exchanges, it is necessary to assess and demonstrate results in a more systematic manner than what is done today. They admit that outcomes of knowledge exchanges sometimes are not visible and known in the organisation. Even when there are easily observable results, such as a new method, the organisation is not always aware of the foreign origin. As regards assessment system, it appears that most internal

people do not want any cumbersome measurement procedures. An easy and practical system that provides insights into achievements and the experience of exchange participants will suffice.

Professionals from abroad appear to have many similar challenges when it comes to knowing and showing results. It seems, however, that a few organisations abroad are more goal-oriented than others are, and they monitor closely the implementation of exchanges in order to assess the applicability of new knowledge for use in their home environment. Discussions with professionals from other organisations reveal that none of them has a system of results measurement. Organisations abroad also rely on sporadic and anecdotal feedback from exchange participants. External people differ in their view on introducing systematic assessments of results. While some of them believe their organisation will take advantage of more systematic assessments, others seem to be satisfied by relying on more ad hoc participants' feedback.

5.7.3 Potential for improvement

There are considerable individual and organisational benefits resulting from knowledge exchanges. There is, however, a potential for making improvements, in particular with regard to the organisation's benefits. Today, there are no systematic monitoring of progress and assessments and demonstration of results.

- **The organisation should adopt a more results-oriented approach to knowledge exchange and make efforts to remove or reduce the identified factors that constrain application of new knowledge. A basic requirement for a results-oriented approach is the definition of knowledge needs.**
- **The defined needs should be used to monitor progress and to assess and demonstrate results of knowledge exchange initiatives. Assessments of results should be based on participants' accounts and reflections.**

5.8 Summing up of findings

The findings provide insights into the knowledge exchange process from the perspectives of exchange participants. Each of them has a distinct story that reflects their experience and viewpoints. The interpretations of their responses are inevitably coloured by my own experience and perceptions.

To judge from the findings, international exchanges contribute to both individual and organisational learning and development. Participants' accounts provide examples of how the organisation makes use of knowledge they have brought into it from abroad. At the same time, the findings clearly show that the process of knowledge exchange is multifaceted and complex, and that there are constraining factors throughout the process that prevent the participants and the organisation from taking full advantage of the exchanges.

There is a considerable potential for making improvements in the way the organisation practices knowledge exchange with other countries. The discussions with road transport professionals abroad show that my findings have relevance to similar organisations abroad. I have proposed measures that are likely to improve the process and thereby increase the results of exchanges. In the next chapter, I make use of the findings and proposed measures to construct a model for effective international knowledge exchange.

6. A model for effective international knowledge exchange

This chapter outlines a model for effective knowledge exchange between countries that is grounded in the research findings. I first explain the model's rationale and justification, then I describe its elements, and lastly, I provide some guidance on its application.

An important feature of work-based research is that the findings should result in recommendations that are practically feasible and applicable, and I have attempted to construct the model with this in mind.

6.1 Model rationale and justification

6.1.1 Use of findings to model development

As the research shows, cross-border knowledge exchange is a manifold and complex process that involves individual, interpersonal, intra-organisational, inter-organisational, and multicultural aspects. The findings call for a model that focuses on needs definition and results orientation, and places the exchange participants in the locus of the process.

The research indicates that there is a potential for enhancements throughout the process, and it therefore seems reasonable to take a holistic look at the process and consider it in a life cycle perspective. From the six themes of chapter 5, it is possible to establish process steps to make up the life cycle. While each step is critical on its own right, they are interdependent and follow a certain sequence.

Figure 1 illustrates the eight steps that form the life cycle. The various steps can be grouped into four phases as shown in the figure. In the following, I explain how I have formed the steps from the research findings. The step numbers in figure 1 are shown in brackets.

Theme 1 – Preferences for ways of exchanging knowledge: According to the findings of this theme, the organisation's needs for knowledge should determine the choice of methods, but the choice should also accommodate the participants' preferred ways of exchanging knowledge. For this theme, I can form two process steps called defining knowledge needs (step 1) and selecting methods (step 3).

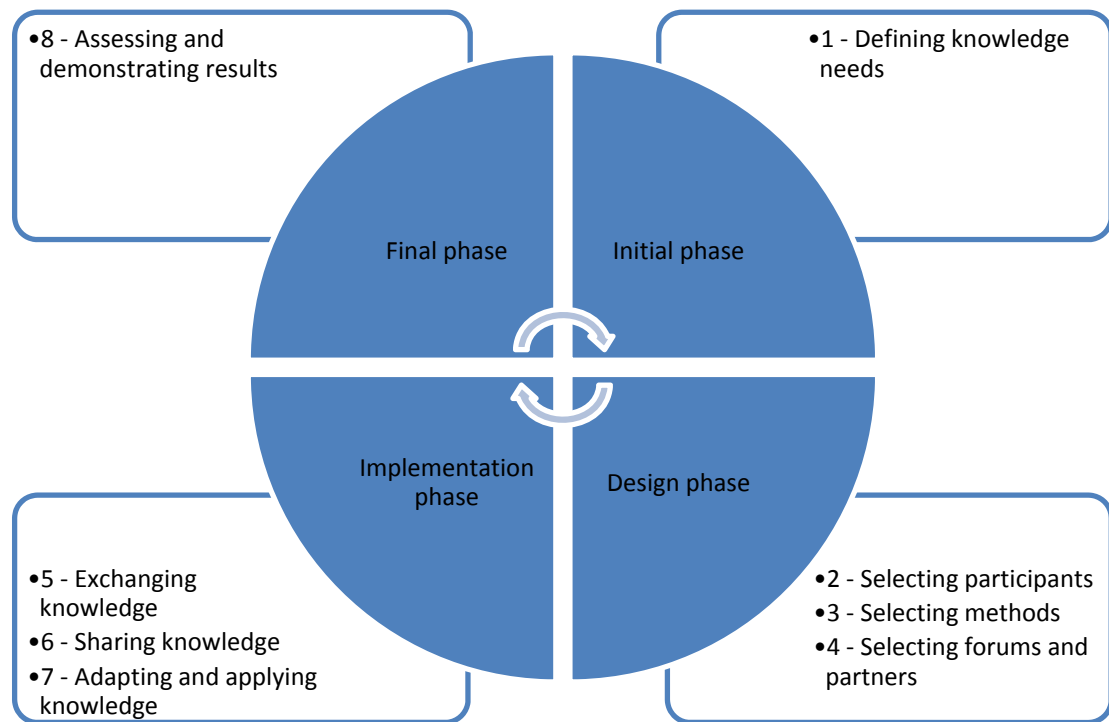


Figure 1: The knowledge exchange life cycle

Theme 2 – Facilitation of knowledge exchange partaking by the organisation: The findings of this theme are about who to take part (criteria and process for participant selection), how to take part (teams versus individuals), and attendance at international conferences. The first two issues fall within a process step that I will call selecting participants (step 2) and the third within a step called exchanging knowledge (step 5).

Theme 3 – Interactions in multicultural settings: Here, the findings deal with the act of exchanging knowledge with professionals from abroad, criteria and process for appointing and preparing participants, and considerations regarding international forums and partners for cooperation. The first two issues sort within the already established steps called exchanging knowledge (step 5) and selecting participants (step 2). The last issue falls within a step that I will call selecting forums and partners (step 4).

Theme 4 – Introduction of new knowledge in the organisation: In this theme, the findings concern how knowledge from abroad is and ought to be shared with co-workers, and factors that constrain the knowledge sharing. Other findings deal with the adaptation of knowledge for application and the importance of influential capacity of participants to promote organisational developments and changes. For the issues of sharing and adaptation for application, I will simply form two process steps called sharing knowledge

(step 6) and adapting and applying knowledge (step 7). As regards the third issue, it sorts within the step called selecting participants (step 2).

Theme 5 – The receiving environment: The findings of this theme are about lack of clearly defined knowledge needs and anchoring of knowledge exchanges in the organisation's goals. This issue sorts within the process step called defining knowledge needs (step 1).

Theme 6 – Benefits of knowledge exchange: According to the findings of this theme, the intended capacity development is constrained, particularly at the organisational level, by factors identified in previous themes. They further show a need for a system to monitor progress and to assess and demonstrate results of exchanges. While monitoring of progress can be embedded in the implementation phase, I will form a separate step for results assessment and demonstration called assessing and demonstrating results (step 8).

6.1.2 Uniqueness of the model

The intended outcome of the research has been to develop a specific model that can guide policies and practices and make international knowledge exchanges more effective. As part of the research, I have drawn on generic models and perspectives in the fields of individual and collective learning, innovation, and organisational learning and knowledge management. The various models and perspectives have served to relate my findings to existing knowledge, although they mainly deal with ways of acquiring, creating, and managing knowledge in private companies. As distinct from private entities, public road transport administrations do not operate in a competitive market, and the cooperation between them is characterised by a relatively high degree of openness and easy flow of knowledge. Through international exchanges of knowledge, they make a joint effort to learn from each other and develop the road transport sector.

The World Bank (2013 and 2014) model for knowledge exchanges among developing countries has some common features with my model. It describes the knowledge exchange process in a life cycle perspective, and it is results-focused. It is, however, intended for use by developing countries to support development initiatives and policy reforms at the national (societal) level. It also includes financing mechanisms that is a key element in a development cooperation context, but not in the context of this research.

While my model has similarities with other models and perspectives with regard to knowledge acquisition, creation, and management, it has unique differences determined by

the characteristics of my organisation and of an international, multicultural knowledge exchange environment. The model I have constructed is thus unique of its kind and a distinctive contribution to the practice of acquiring and applying knowledge for capacity development in the road transport sector. Even if it is based on research within my organisation, discussions with professionals abroad surely signal its relevance to other road transport organisations engaged in international cooperation.

6.2 Description of model elements

This section describes the four phases of the model and the steps within each phase.

6.2.1 Initial phase

In the first phase of the knowledge exchange process, the step to be taken is 1) defining knowledge needs. A decision to acquire foreign knowledge should be based on defined knowledge needs. Defining knowledge needs is about identifying, articulating, and justifying needs for foreign knowledge. Clearly defined needs are important as they determine the intention and direction of a knowledge exchange initiative, guide the other steps, and form the foundation for monitoring progress and assessing and demonstrating results of the knowledge exchange.

It is important to anchor the defined needs in the strategic and operational plans of the organisation and to align the needs with organisational goals and priorities. The World Bank (2014) points out that deciding on a knowledge exchange initiative before anchoring the initiative can be a waste of money and effort. A knowledge exchange initiative is usually one of several capacity building efforts to achieve organisational goals, and thereby improving performance. Organisational goals state the level of performance the organisation has to achieve. Knowledge exchanges alone will not enable the organisation to achieve its goals; they can only contribute to the achievement.

6.2.2 Design phase

Designing knowledge exchange initiatives includes the steps 2) selecting participants, 3) selecting methods, and 4) selecting forums and partners. The sequence of these steps can be altered, but preferably, participants should be selected first, and then be involved in the further design of initiatives.

The participants play a critical role in the knowledge exchange process, as its success largely depends on having the right kind of employees involved. The World Bank (2013) emphasises that the participants need to have relevant experience to share and be in key positions to effect change. It is important that the participants have a strong sense of the defined knowledge needs, and that they work in an environment that allows them to act on and share the knowledge they acquire. The organisation should select employees who are willing and suited to partake in exchanges and act on what they learn.

Groups/teams of colleagues, rather than individuals, should be engaged in all kinds of knowledge exchanges. Groups/teams engaged in exchanges will gain collective learning and experience and are likely to learn more than one person alone, and it will become easier to share and introduce new knowledge in the organisation. According to Cabrera and Cabrera (2005), designing work around teams gives employees the opportunity to work closely with others and encourages knowledge sharing. In collective (team) learning processes, individuals not only learn from each other, but also develop a shared understanding and meaning about the learning process and the learning that is derived (Garavan, T. N. and McCarthy, A., 2008). By involving groups/teams, the organisation also becomes less vulnerable to staff turnovers. Groups/teams of participants will require more resources, but as discussed in section 5.3.2, it can be more beneficial to involve several people in a few international groups than only one person in many groups if budgets are restricted.

The defined knowledge needs should guide the selection of methods. In addition, one should consider the participants' preferences for ways of exchanging knowledge (if they have already been appointed), budgets, and timeframes. A knowledge exchange initiative can consist of a single method or multiple methods depending on the knowledge needed.

Like the selection of methods, the defined knowledge needs should guide the selection of forums and partners. The selection of forums and partners is closely connected to the selection of methods. Participation in international forums usually offers both long-term methods (committees, working groups, and cooperation projects) and conferences and similar short-term events. There exist both multidisciplinary and specialised forums, and they serve global or regional audiences. In cooperation with partners (usually similar organisations in other countries), common methods are study tours, staff exchanges, and cooperation projects. In the selection of forums and partners, one should also consider regional cooperation and/or global cooperation.

6.2.3 Implementation phase

The implementation phase comprises three steps: 5) exchanging knowledge, 6) sharing knowledge, and 7) adapting and applying knowledge. As regards long-term exchanges, the steps of the implementation phase form a cyclic and continuous sub-process as sharing and adaptation of knowledge in the home organisation occurs both during and after the exchanges. Monitoring of progress should be embedded in the implementation phase. The defined knowledge needs should guide the monitoring.

Exchanging knowledge in multicultural settings can be challenging. When people with different ethnic and cultural background, language, worldview, attitudes, personalities, and expectations gather, there will usually be some tensions and problems. Adler (1991) suggests that one should assume difference until similarity is proved, since no two national groups see the world in exactly the same way. In addition, financial and time constraints can hamper the learning process. At the same time, working with people from other countries and cultures can be inspiring and enriching. People with different worldview, frames of reference, and mind-sets who work under different internal and external conditions can provide each other with new ideas, insights, and perspectives. Although conditions in other countries can be very different and not comparable, learning about them can contribute to a better understanding of one's own situation and trigger new thinking.

If the participants do not share and disseminate what they learn abroad with their colleagues and managers at home, the exchanges are of little use to the organisation. Both individual and organisational factors influence the knowledge sharing. The willingness and ability of employees to share their knowledge depends on factors such as attitudes and time. Organisational factors include arrangements and opportunities for sharing and support from colleagues and managers. According to McNichols (2010), management support is the core of a knowledge sharing culture. While organisational structures and working environment have high impact on the flow of knowledge within the organisation, the use of ICTs for storing and sharing of knowledge plays a supplementary role. As stated by Davenport and Prusak (2000), information technology cannot guarantee or promote knowledge sharing in a culture that does not favour sharing.

A successful knowledge exchange implies application of the knowledge acquired abroad in a way that contributes to achieving organisational goals. However, one cannot transfer

knowledge directly from one country and culture to another. If one scans for knowledge globally, one also needs, before using it, to pay very close attention to the local context of the origin of the knowledge (Denning, 2002). Useful approaches, practices, and solutions in one country have to be adapted to suit the specific context and needs of another. It is by the local selection, assimilation, and adaptation of knowledge that local doers make it their own (Stiglitz, 2000). It is therefore necessary to appraise to what extent, and in which ways, the knowledge of others are applicable and can be effective in the organisation's environment.

6.2.4 Final phase

The final phase includes step 8) assessing and demonstrating results. Results assessment and demonstration is important in order to know and show what has been achieved. Assessments of result can also serve to guide future knowledge exchanges and reduce the risk of perpetuating bad practices.

There are two levels of results that should be assessed: intermediate results (participant capacity development) and knowledge exchange results (organisational capacity development). The defined knowledge needs should guide the results assessments.

6.3 Guidance on model application

This section offers some practical guidance on the use of the model. Since the model promotes needs-based and results-focused knowledge exchanges, I provide particular guidance on how to connect defined knowledge needs, progress monitoring, and results assessments. In addition, I provide some guidance on how to design and implement knowledge exchange initiatives.

6.3.1 Connecting defined knowledge needs, progress monitoring, and results assessments

Defining knowledge needs

The organisation may have a number of areas in which it needs to develop capacity. Time and money will usually not allow all needs to be addressed through knowledge exchanges with other countries, and it will be necessary to prioritise the most pressing needs or the needs in areas of high priority. One has to consider whether it is necessary to go abroad to

acquire new knowledge, or whether the knowledge needed already exists within the country, or within the organisation. Another issue of attention is what other capacity development efforts are ongoing or planned within the organisation.

Groups consisting of employees (including prospective participants) and managers within the disciplines concerned should be involved in the process of defining knowledge needs, while the management should make decisions on knowledge exchange initiatives.

Experience of the Transportation Research Center (1992) shows that needs generated from the bottom-up are most easily put into practice, and one should therefore listen to those who have technical needs in the workplace. Defined knowledge needs should express expected intermediate results (participant capacity development) and expected knowledge exchange results (organisational capacity development).

Knowledge needs can be classified as reactive and proactive as explained in section 5.6.2. Reactive needs emerge in response to identified gaps in knowledge. Such needs can be based on concrete problems or projects that require new solutions or ways of working. Proactive needs are intentions to identify opportunities for developing capacity. In such cases, the intention can be to identify good practices, benchmark, and keep pace with the developments. Box 9 provides examples of reactive and proactive needs. The examples are non-factual, but yet realistic.

Monitoring progress

Monitoring of progress towards achieving results should be carried out during the implementation phase. Managers of participants should be responsible for the monitoring in consultation with the participants. Monitoring of progress is a continuous activity, and the progress should be documented in regular progress reports. The frequency of progress reporting depends on the size and complexity of the knowledge exchange initiative, but every six months or yearly seems appropriate.

For long-term exchanges, both the exchange process and the integration process should be monitored. For short-term exchanges, only the integration process needs to be monitored. During long-term exchanges, one has to check if the mix of participants (in teams), methods, and forums/partners is appropriate or has to be changed. One should further check if the participants, as individuals and as team members, are well suited and contribute to the team learning. During the integration process, one should check if the kind and level of sharing activities is appropriate, and if the participants act as catalysts for

the introduction and adaptation of new knowledge in the organisation. If there is little or no progress, it is the responsibility of the managers to implement corrective measures.

A reactive need
<p>Two road projects are selected for piloting a Public Private Partnership (PPP) model. In the PPP model, a PPP company is given the full responsibility for designing, constructing, financing, and operating a road section on behalf of the State for a given period. The road transport administration as the client is responsible for the road planning and for controlling the quality and performance of the road service. This model is new to the organisation, and it decides to go abroad to learn from other countries having experience with PPP projects.</p> <p>Expected intermediate result: Participants should acquire knowledge about contracting and supervision of PPP projects.</p> <p>Expected knowledge exchange result: The organisation should to be able to contract and supervise PPP projects.</p> <p>Organisational goal: Be a competent client in road construction projects.</p>
A proactive need
<p>Increased stakeholder influence and media scrutiny make good governance and anti-corruption measures important. The performance measurement system of the organisation reflects these issues, but still the organisation finds it worthwhile to explore if there is more to learn from other countries.</p> <p>Expected intermediate result: Participants should identify good practices on good governance and corruption fighting of road transport administrations abroad.</p> <p>Expected knowledge exchange result: The organisation should become in a better position to make decisions on the performance measurement system with regard to good governance and anti-corruption measures.</p> <p>Organisational goal: Be a responsible and reliable public authority.</p>

Box 9: Examples of defined knowledge needs

Assessing and demonstrating results

Both intermediate and knowledge exchange results are difficult to measure, but they can be assessed or observed. To provide information on results, one should rely on the participants' self-assessments as concluded in section 5.7.3.

Assessing intermediate results (participant capacity development): The participants should provide their accounts and reflections of what knowledge they have acquired compared with expected intermediate results as expressed by the defined knowledge needs. The

participants' written accounts should be disseminated and discussed with colleagues and managers concerned. In addition, the participants should report on unexpected results, such as new ideas and insights they have acquired. The assessments of intermediate results should take place upon completion of exchanges.

Assessing knowledge exchange results (organisational capacity development): The participants should provide their accounts and reflections on the developments and changes they have created or observed compared with expected knowledge exchange results as expressed by the defined knowledge needs. The participants' written accounts should be disseminated and discussed with colleagues and managers concerned. In addition, the participants should report on unexpected results, such as new ideas and insights that have resulted in changes in the organisation. The assessments should take place upon completion of the implementation phase.

Demonstrating results: The knowledge exchange results are reflected in the application of new knowledge in a way that contributes to achieving organisational goals. Some results are tangible and easy to observe. By way of example, the organisation has increased its capacity in the field of road pavements as it applies new and more cost-effective methods resulting from knowledge exchange. Intangible results, on the other hand, can be hard to observe and demonstrate. For example, the organisation has developed its capacity in the field of strategic planning as it applies effective processes that are influenced by knowledge from abroad. It is, however, difficult to trace the foreign knowledge part of the improved capacity, since there are other contributing factors. Attribution can be tenuous, but it is still important to look for connections with the knowledge exchange.

An overview of the connection between defined knowledge needs, progress monitoring, and results assessments is shown in box 10.

	Definition of knowledge needs	Monitoring of progress	Assessments of intermediate results	Assessments of knowledge exchange results
Specifications	<ul style="list-style-type: none"> Expected intermediate results Expected knowledge exchange results Organisational goal(s) concerned 	<ul style="list-style-type: none"> Monitoring of progress towards achieving expected results Long-term exchanges: monitoring of exchange process and integration process Short-term exchanges: monitoring of integration process 	<ul style="list-style-type: none"> Achieved intermediate results versus expected intermediate results Unexpected intermediate results 	<ul style="list-style-type: none"> Achieved knowledge exchange results versus expected knowledge exchange results Unexpected knowledge exchange results Contribution of results to achieving organisational goal(s)
By whom	<ul style="list-style-type: none"> Groups of employees and managers concerned 	<ul style="list-style-type: none"> Managers in dialogue with participants 	<ul style="list-style-type: none"> Participants in dialogue with colleagues and managers 	<ul style="list-style-type: none"> Participants (groups/ teams) in dialogue with colleagues and managers
When	<ul style="list-style-type: none"> Before management's decisions on knowledge exchange initiatives 	<ul style="list-style-type: none"> Continuously during the implementation phase 	<ul style="list-style-type: none"> Upon completion of exchanges 	<ul style="list-style-type: none"> Upon completion of the implementation phase
Documentation	<ul style="list-style-type: none"> Descriptions 	<ul style="list-style-type: none"> Regular progress reports 	<ul style="list-style-type: none"> Participants' written accounts and reflections 	<ul style="list-style-type: none"> Participants' written accounts and reflections

Box 10: Connection between defined knowledge needs, progress monitoring, and results assessments

6.3.2 Designing knowledge exchange initiatives

Selecting participants

Participants should be selected according to certain criteria and in a transparent manner in order to gain acceptance among employees. Box 11 outlines criteria for selecting participants.

- Professional qualifications and work experience that match the defined knowledge needs
- A good command of the English language (the organisation should provide for English language training if needed)
- Position and responsibilities that foster introduction of new knowledge in the organisation
- Catalytic skills and ability to initiate, influence, and drive developments and changes in the organisation
- Time available to take part in exchanges throughout the process

Box 11: Participant selection criteria

In addition to these criteria, it is important that the participants are able to act in multicultural settings. The organisation should provide for cross-cultural training in order to raise awareness of cultural diversity and for the participants to develop cultural sensitivity. Lewis (2006) states that a working knowledge of the basic traits of other cultures as well as one's own, will minimise unpleasant surprises and give insights in advance.

The participants should take part in short-term exchanges (study tours and conferences) in groups with the view to enrich the learning process. They should preferably have diverse qualifications, experience, and perspectives. According to Nonaka and Takeuchi (1995), the sharing of tacit knowledge among multiple individuals with different background, perspectives, and motivations is a critical step for organisational knowledge creation to take place. In long-term exchanges (committees, working groups, cooperation projects), the participants should take part as team members rather than as individuals. Teams should be small to ease cooperation and communication. As for short-term methods, they should preferably have diverse qualifications, experience, and perspectives. They should further have the ability to contribute to positive group dynamics.

Selecting methods

Finding a good match between individual preferences for ways of exchanging knowledge and methods can enhance the learning process. As proposed in section 5.2.1, the participants can make use of diagnostics, such as the Myers-Briggs Type Indicator (MBTI, 2015), to learn more about their personality and how they act in exchanges. Box 12 provides four typified profiles of knowledge exchange participants that are based on generic MBTI function pairs data and research data. Using these profiles can contribute to making appropriate selections of methods.

Each participant has his/her preferences, but the research reveals some common features. Participants tend to prefer exchange of tacit knowledge through social interaction and networking with other professionals. Networks are efficient when they are closely related to an actual demand for knowledge (Denning, 2002). It is easier to build relationships and trust by face-to-face interactions than by virtual means of communication. Exchanges of knowledge in small groups ease the interaction and communication among group members. Multidirectional activities (knowledge flows in all directions, participants directly exchange their experience, practices, and tacit knowledge) are generally preferred to unidirectional (knowledge passed in one direction, involves explicit knowledge, such as lectures, presentations, and written materials), since they involve more dialogue and interaction, and more exchange of tacit knowledge. Box 13 outlines the suitability of the most common long-term and short-term methods.

When selecting methods, one should also think of boundary spanning across related disciplines. Although well-scoped and bounded exchanges facilitate in-depth learning, crossing the boundaries of one's discipline can lead to unexpected insights and ideas. According to Johnsen (2010), good ideas often appear when one allows the mind to move through multiple boxes. It can therefore be valuable for the participants to cross the boundaries of his/her discipline and interact with professionals of related disciplines.

Generic MBTI function pairs data	Profiles of knowledge exchange participants based on generic MBTI function pairs data
<ul style="list-style-type: none"> • Sensing-Thinking (ST) personality: A ST personality is pragmatic, logical, and systematic. S/he pays most attention to what comes in through the senses, is concerned with the physical reality, and prefers to see the practical use of things. The ST personality trusts experience more than words and focuses on facts and details and not the big picture. • Sensing-Feeling (SF) personality: The SF personality has a people-oriented approach to work. S/he prefers to be practical, focus on realities, and care for individual well-being. Like the ST personality, the SF personality focuses on realities and learns through the senses. S/he prefers to see practical solutions to problems and learn from experience. The SF personality also trusts experience more than words and focuses more on facts and details than the big picture. • Intuition-Thinking (NT) personality: The NT personality is logical and analytic, and focuses on ideas and possibilities, particularly those having a technical application. S/he is concerned with concepts and theories and prefers work that stimulates the intellect and imagination. The NT personality prefers to learn by thinking a problem through and see the big picture before facts and details. • Intuition-Feeling (NF) personality: The NF personality is enthusiastic and idealistic and prefers work that engages the imagination and abstract thinking. S/he flourishes in flexible settings in which s/he is stimulated by new ideas and possibilities, particularly for people. The NF personality prefers to learn by thinking a problem through and see the big picture before facts and details. S/he has a people and communication orientation and is concerned with values. 	<ul style="list-style-type: none"> • Sensing-Thinking (ST) participant: The ST participant prefers taking part in group discussions over time and in one-time group discussions to exchange existing knowledge and practical know-how. S/he prefers to learn from other people's experience. The ST participant enjoys in particular activities where s/he can see how solutions work in practice, such as field visits. S/he thrives best when exchanges are well organized and structured, and prefers to take part in goal-oriented and focused activities. The ST participant focuses more on tasks than people and likes to see the tasks completed. • Sensing-Feeling (SF) participant: Like the ST participant, the SF participant prefers to take part in group discussions over time and in one-time group discussions to exchange existing knowledge and practical know-how where s/he can learn from other people's experience. The SF prefers to learn from seeing how solutions work in practice, such as in field visits. In contrast to the ST participant, the SF participant is most concerned with people and likes to see practical results that benefit the people involved. • Intuition-Thinking (NT) participant: S/he participant has a preference for taking part in group discussions over time for co-creation of new knowledge and in joint production of reports, and for giving presentations. These activities require more abstract and deeper thinking than other knowledge exchange activities. The NT participant is more task-oriented than people-oriented. • Intuition-Feeling (NF) participant: Like the NT participant, the NF participant prefers to take part in group discussions over time for co-creation of new knowledge and in joint production of reports, and to give presentations. These activities require more abstract and deeper thinking than other knowledge exchange activities. S/he has a focus on human aspects and the people involved.

Box 12: Typified profiles of knowledge exchange participants

Long-term methods
<ul style="list-style-type: none"> • Committees, working groups, and cooperation projects: These methods facilitate exchange of both tacit and explicit knowledge through in-depth, face-to-face and virtual exchanges among peers, continuous learning, and network-building. While all long-term methods are suited for exchanging knowledge and learning about new methods, technologies, and practices, cooperation projects are particularly suited for co-creation of new knowledge. • Staff exchanges: Staff exchanges also allow for exchange of tacit and explicit knowledge through in-depth, face-to-face exchanges among peers, continuous learning, and network-building. Staff exchanges are usually long-lasting, and require more resources compared with other methods.
Short-term methods
<ul style="list-style-type: none"> • Study tours: Study tours allow for a high level of interaction among participants and exposure to the topic of study, and an opportunity to see how things work in practice. Study tours can be appropriate if, for instance, there is a need to know how to manage a new method. Although study tours usually last for a few days, high level of interaction facilitates exchange of tacit knowledge. • Conferences: Conferences and that alike are suited to get a state-of-the-art overview and to learn what knowledge exists and about new concepts. Usually they do not provide for in-depth learning, and mostly explicit knowledge is exchanged. The level of interaction, however, depends on the size of the event and the use of social media (Twitter) during the events. There is usually more interaction at small seminars and workshops than at large conferences.

Box 13: Suitability of knowledge exchange methods

Selecting forums and partners

The participants should be engaged in the search for relevant and transferable knowledge and in the choice of forums and/or partners. Information on where to find relevant knowledge might exist, but it can be worthwhile to explore different sources before making decisions. One can consult with prospective international forums and national organisations abroad, and conduct searches in virtual libraries and databases. As regards partners, one has to make sure that prospective partners have the resources and capacity to take part in exchanges.

A blend of participation in international forums and bilateral cooperation can be useful, since it can provide for different perspectives and exposure to various ideas, experiences, and solutions. Both regional and global cooperation should be considered depending on the

knowledge needed. As expressed in section 5.4.2, hard-core technologies can more easily be adapted from everywhere, since context and sociocultural factors do not matter significantly. Soft issues, such as work practices, usually require more cultural similarity.

6.3.3 Implementing knowledge exchange initiatives

Exchanging knowledge

While the primary intention is learning, knowledge exchange is also about contributing. It is important that the participants actively engage in the work by contributing their knowledge, discussing the knowledge, and absorbing and making sense of others' knowledge. Exchanging knowledge with others involves critically and analytically rethinking the observations in order to learn in the process (World Bank, 2013). As emphasised in step 2, groups/teams of colleagues from the organisation should take part in exchanges, and the participants should share impressions and viewpoints among themselves during exchanges in order to enrich the learning process.

In international settings, one cannot expect active cooperation and contribution by all participants. There might be people who, for various reasons, are not able or willing to make a substantial contribution to the work. The participants have to pay attention to cultural and social norms and act tactfully and be sensitive to cultural diversity. They need to understand the social and cultural contexts of knowledge and experience found abroad.

Attendance at international conferences needs particular attention. In contrast to other methods, they mainly facilitate exchange of explicit knowledge without a defined context. In order to optimise benefits from conferences, the organisation and prospective attendees should make sure that the conference topics match the knowledge needs. As proposed in section 5.3.1, attendees should review the conference programme with colleagues before the event, and they should act as proxy information gatherers for non-attending colleagues during the conferences. The use of social media, such as Twitter, during conferences allows anyone to participate virtually, and attending and non-attending colleagues can interact during conferences in addition to having discussions after the events. Twitter is increasingly used during conferences in manifold ways from arranging, sharing, commenting, etc. (Ebner and Reinhardt, 2009).

Sharing knowledge

The participants, colleagues, and managers have to set aside time for knowledge sharing activities. Lack of time is an important individual barrier to sharing knowledge (Riege, 2005; Sandhu et al., 2011). The role of managers is to encourage, facilitate, and monitor the sharing. Little commitment of managers hampers knowledge sharing processes (Rivera-Vazquez et al., 2009). Sharing of knowledge is not a one-off activity; it should take place continuously. In order to engage the participants' colleagues and managers, they should be involved from the beginning of exchanges. It is particularly important that colleagues and managers are supportive and engaged during long-term exchanges.

Sharing of knowledge should occur within the participants' unit, in existing networks, and at the organisational level. McDermott and Dell (2001) states that human networks are one of the key vehicles for sharing knowledge and that knowledge sharing networks should be built on already existing ones. It should emphasise dialogue and social interaction (oral sharing) that allows tacit knowledge to be shared in addition to explicit knowledge. Sharing should further take place in both informal and formal ways. Informal sharing is the self-organised and spontaneous sharing that occurs when the participants interact and socialise with colleagues while carrying out their daily tasks. Managers should encourage such informal sharing, and they should further facilitate formal and structured sharing arrangements where the participants can present and discuss their new knowledge and experience with colleagues. Such arrangements can consist of presentations and discussions in staff meetings and projects meetings, in existing networks, and in information sessions and seminars.

In addition to informal and formal oral (face-to-face) sharing that provide for high richness of knowledge, sharing should take written forms to increase the reach of new knowledge. While sharing mechanisms with high richness are more suited to transfer knowledge, mechanisms with high reach are more suited for creating awareness of knowledge (Chai, 2010). The participants should distribute or make colleagues and managers aware of relevant documents resulting from exchanges (technical reports, study tour reports, conference papers, etc.). In order to reach everyone in the organisation, the participants should make use of the organisation's intranet to publish information, reports, newsletters, articles, etc.

Adapting and applying knowledge

The adaptation process includes appraisals of applicability. Such appraisals may include further research, practical testing, and/or demonstration to verify the applicability and usefulness of new knowledge. Demonstration of new technologies can accelerate the adaptation (Transportation Research Center, 1992). For new knowledge to be applied, it may also be necessary to change or modify existing administrative, legislative, or technical regulations. The adaptation process may therefore take considerable time. Appraisals of applicability may even conclude that the knowledge found abroad does not suit the specific needs of the organisation and cannot be put to use in the home environment.

It is crucial that the participants act as catalysts to initiate, influence, and drive the process of adapting new knowledge. Managers need to motivate participants and monitor the adaptation process.

7. Reflections on impact

In this chapter, I reflect on the professional and personal impact of the research. It deals with dissemination of the research results and promotion of the proposed model in my organisation and the professional community abroad, and my personal learning and development. I also point out some new questions that have arisen from this work and that can be subject to further research.

7.1 Professional impact

In section 2.4, I identified the project's benefits and beneficiaries. The benefits are improved results of international knowledge exchanges manifested in new policies and practices, if the proposed model is applied. The beneficiaries are primarily my organisation and its employees who take part in knowledge exchanges with other countries. Additionally, road transport administrations abroad and international forums can benefit from the research. As shown in chapter 5, the relevance of the research for other organisations is largely confirmed by my discussions with professionals abroad. They experience many of the same constraints and challenges in the knowledge exchange process, and their views align well with those of people of my organisation. Naturally, external and internal people hold different views when it comes to conditions that are specific to my organisation, such as ways of facilitating knowledge exchanges. I further believe that the project's findings and recommendations can be of value to international forums by providing insights into knowledge exchange processes from the perspectives of participants. The project can contribute to develop the strategies and operations of such forums. In my opinion, the NVF process (appendix 1) would have benefitted from better insights into participants' views and experience.

A work-based research project has its value in the practical implementation. I have been disseminating results and promoting changes in practice not only in my organisation, but also in the international professional community. In making a case for change, it has been necessary to present a practical reasoning in a clear and persuasive manner. I feel that my research has generally appealed to the professional audience and made them curious. The immediate response has often been that the proposed model makes sense and appears easy to understand. In appendix 9, I present the slide set used for presenting the model to internal and external audiences.

I believe that the results have significant value to my organisation and to the road transport community abroad. Little research exists on knowledge exchange across borders, and this project has generated new empirical insights and a better understanding of the complexity of the topic. The real value of the model can, however, only be demonstrated when it has been used for some time.

Promotion of changes in the organisation

I have taken several actions to motivate the prospective users of the model and prepare the ground for its application. Some 30 employees of the organisation took part in the research as participants in individual interviews and/or focus group discussions. Their involvement has run smoothly as they have been willing and enthusiastic to share viewpoints and experience. In my communication with the participants, I have emphasised their role and contribution in identifying and developing new ways of working. They appear to have appreciated the opportunity to gain new insights into their involvement in knowledge exchanges. It is my impression that their participation in the project has made them reflect more on ways of exchanging knowledge with peers abroad. Many of them have expressed support to my proposals, and they now anticipate changes that will yield better individual and organisational results.

In addition to finding support among participants, my promotion of the project in the organisation has included sensitisation of managers. In my presentations and discussions with managers concerned, I have argued that using the model will create a more reflective practice and give higher returns of knowledge exchange initiatives to the organisation. I know the working environment and culture well, and I had no expectations of an immediate embracement of the model. I was rather expecting some kind of inquiring and curious responses, and the actual feedback has been nearly what I expected.

While managers acknowledge the purpose of improving results, there seems to be a concern about potential cost implications of international travelling. A few managers appear to be reluctant to change the state-of-practice, not because they hold negative attitudes towards international activities, but because these activities are not their top priority. In my response to the feedback from managers, I have argued that successful international knowledge exchanges require strong support and commitment from the management and that well-grounded and well-implemented knowledge exchanges can give high returns to the organisation. In the time to come, I have to continue sensitising and

persuading managerial staff. As mentioned, many participants anticipate changes, and I am confident that they will support me in my efforts.

As the next step, I am planning to test the model practicality and pilot it on a small scale. If the piloting turns out to be a positive experience for those involved, it can pave the way towards full-scale implementation and revision of the current policy for international knowledge exchange to be incorporated in the organisation's quality system referred to in section 3.4.4. A revised policy will constitute a formal endorsement of the model.

Dissemination of research results in the international community

Since the research project is context-bound and has a high level of subjectivity, I should be careful generalising the results and make them valid in other settings. However, as discussed in section 4.4, it is fair to claim some kind of transferability to similar settings. In this connection, it means that the results can be applied by road transport administrations abroad. At least, other organisations should have an interest in knowing about the research, since it can give them ideas and inspiration to review their own practice.

In disseminating the project's results internationally, it has been my strategy to share my work in direct contact with peers and professionals, as I believe oral dissemination and direct contact with people is equally important as print-based dissemination and may even have greater impact. In this way, I could also get immediate reactions to preliminary findings and the proposed model. In addition to oral dissemination to people abroad in connection with international meetings and other events, I have submitted a paper to an international conference. Here I give an account of my international dissemination activities.

Informal presentations and discussions

Presentations and discussions with people of other national road transport administrations have been very valuable, as I have gained insights into the strategies and ways of working in other organisations and feedback on my research. I have also discussed my research with people of international forums, since such bodies have an interest in knowing how member organisations view their activities and services.

In January 2015, I attended the 94th Annual Meeting of the Transportation Research Board in Washington D.C. This is the biggest international conference within the transport sector with attendance of more than 10.000 researchers and practitioners from all over the world.

I took this opportunity to discuss my preliminary research findings with peers from abroad, and I took part in workshops on knowledge management and technology transfer in which I informed the audience about my work and early findings. Most people I met expressed a genuine interest in my research.

At the same occasion, I was invited by the World Bank to attend a one-day workshop on knowledge exchange. As the World Bank promotes knowledge exchanges for better and faster development results, it organises regular training and sensitising workshops. The workshop gathered people from various fields, such as rural development, water and sanitation, and health care. It was very inspiring to discuss the topic with professionals from other fields and discover that there are many similar approaches and challenges across different actors and fields. I received many positive responses to my contributions from the field of road transport.

Paper for presentation at the 95th Annual Meeting of the Transportation Research Board

The Annual Meeting of the Transportation Research Board in January 2016 provided a new opportunity to present my research to the international professional audience. I submitted a paper for peer review that summarises the main findings of the research and the proposed model for effective international knowledge exchange. The paper is included in appendix 10. It was selected for presentation in a lectern session and for inclusion in the Annual Meeting Compendium. The paper was found to be of potential interest to practitioners as practice-ready. Practice-ready papers are defined as those in which the research results presented and discussed contribute to the solution of current or future problems or issues for practitioners. I was particularly excited by a comment from one of the reviewers who wrote: *"I enjoyed reading the paper and am excited about the method and recommendations. I can't wait for this paper to be given so I can use it in my organization!"*

There was little time for questions and discussion during the session, but several attendees approached me after the session. They were curious about my work because they had no such model or other tools in their organisation for exchanging knowledge with organisations abroad. They were obviously in need of tools to support knowledge exchange initiatives, and most of them expressed an intention to introduce the model in their organisation. From the discussions, it appeared that a main concern is the costs related to face-to-face communication, which they considered most effective. Since budgets are becoming more restricted, they envisioned a higher reliance on less costly, virtual

interactions in the future. I believe this is a situation faced by many organisations, and it will be a challenge to apply ICTs in ways that create effective knowledge exchanges.

7.2 Personal impact

The research has given me a valid foundation to question the state of practice in this field. It has been a worthwhile effort in that I have been able to come up with a feasible and applicable model for improving returns of knowledge investments. I have positioned myself as a change maker and found a great deal of support among practitioners and managers, both nationally and internationally. I have had the opportunity to use my experience from the professional field and the workplace to create new knowledge-in-context. It has been very fascinating to carry out work-based research that allows for discovery of knowledge embedded in work practice and for development of new knowledge linking theory and practice in a real-life work setting.

Overall, it has been a positive experience to carry out research in my own organisation. In this regard, my experience with insider research from the NVF process has indeed been useful. I feel I have been able to handle potential threats, such as my managerial position and my preconceived ideas, in a way that the findings and recommendations appear as trustworthy. Rethinking my underlying personal assumptions and biased perceptions has been challenging, but it has given me a deeper understanding and new perspectives. I believe that being an insider with substantial international experience has made it easier to get acceptance for the research results.

The project has required a high level of motivation and capacity for self-direction. At times, it has been hard to cope with studies, work, and private life. However, the expected learning outcomes and the support from people around me have been very encouraging. My previous experience with project and process management has been useful in managing the various elements of the research project according to the plan and timetable. In this regard, it has been particularly important to access participants and other people involved in an appropriate and timely fashion.

I have gained more knowledge, insight, and understanding of the professional area. I have further had the opportunity to increase my research capabilities in general and gain more experience with qualitative research in particular. I appreciate even higher now the strength of qualitative research in understanding social and cultural phenomena and

human attitudes and behaviours. By applying an inductive approach, I have had a real feeling of exploring new ground. I have further become more aware of the various ethical aspects involved in research projects. I have improved my skills in analysing and synthesising complex and occasionally conflicting data from multiple sources in order to find patterns and relations, and draw conclusions. Reflections on my own practice and that of others have enabled me to discover possibilities for new ways of thinking and acting.

I decided to start the writing process at an early stage, and I feel that the continuous drafting has greatly helped me clarify my ideas and thinking as the project has progressed. At the same time, I must admit that the report writing has been a great challenge because I am used to a different writing style. During my career, I have mainly been writing technical reports and government documents in which the voice and opinions of the writer should not be heard. In this report, I have had to be present as part of the research, and I have put a great deal of efforts into writing in a more personal, reflective, and reflexive manner.

The project has broadened and deepened my knowledge about the research topic and been a very useful learning and development process. It has been very rewarding to discover the value of critically reflect upon and question current policies and practices. I am changed in terms of being more reflective and sensitive to work settings including power relationships and the dynamics of my relationships with others. I now feel more accomplished professionally and personally. I have been involved in international work in various forms for many years, and this project has given me more inspiration to continue working internationally.

As pointed out by managers in my organisation and by attendees at the Transportation Research Board session, there are concerns about the costs of international knowledge exchanges that involve face-to-face interactions. Although most people recognise the value of face-to-face contact, budget restrictions may cause a shift towards more virtual exchanges. Apart from costs, the workforce demographics also affect the ways of interacting and communicating. In the years to come, there will be more digital natives engaged in knowledge exchanges, and they will probably have a higher preference for use of ICTs than what today's participants have. The changing character of the workforce raises new questions to be answered. It will be of particular interest to find out how a changed workforce will influence ways of exchanging knowledge and how virtual means of communication can be effective in international knowledge exchanges. I am hopeful that the research has paved the way for new and exciting work opportunities in the future.

References

- Adler, N. J. (2001), "Communicating across cultural barriers", in *International Dimensions of Organizational Behaviour*, 2nd ed, PWS-KENT Publishing Company, Boston, pp. 63-91.
- Amayah, A. T. (2013), "Determinants of knowledge sharing in a public sector organization", *Journal of Knowledge Management*, Vol. 17 No. 3, pp. 454-471.
- Arbnor, I. and Bjerke, B. (2009), *Methodology for creating business knowledge*, 3rd ed, Sage, London.
- Ardichvili, A., Page, V. and Wentling, T. (2003), "Motivation and barriers to participation in virtual knowledge sharing in communities of practice", *Journal of Knowledge Management*, Vol. 7 No. 1, pp. 64-77.
- Boud, D. and Hager, P. (2012), "Re-thinking continuing professional development through changing metaphors and location in professional practices", *Studies in Continuing Education*, Vol. 34 No. 1, pp. 17-30.
- Burrell, G. and Morgan, G. (1985), *Sociological paradigms and organisational analysis*, Heineman, London.
- Cabrera, A. and Cabrera, E. F. (2002), "Knowledge-sharing dilemmas", *Organization Studies*, Vol. 23 No. 5, pp. 687-710.
- Cabrera, A. and Cabrera, E. F. (2005), "Fostering knowledge sharing through people management practices", *The International Journal of Human Resource Management*, Vol. 16 No. 5, pp. 720-735.
- Cabrera, A., Collins, W. C. and Salgado, J. F. (2006), "Determinants of individual engagement in knowledge sharing", *The International Journal of Human Resource Management*, Vol. 17 No. 2, pp. 245-264.
- Chai, K. H. (2010), "Knowledge sharing mechanisms", in *Encyclopedia of Library and Information Sciences*, 3rd ed, Taylor and Francis, New York, pp. 3176-3183.
- Chesbrough, H. W. (2003), *Open Innovation: The New Imperative for Creating and Profiting from Technology*, Harvard Business School Publishing, Cambridge.

- Coghlan, D. (2003), "Practitioner research for organizational knowledge", *Management Learning*, Vol. 34, No. 4, pp. 451-463, available at:
<http://mlq.sagepub.com/cgi/content/abstract/34/4/451> (accessed 24 November 2015).
- Costley, C., Elliot, G. and Gibbs, P. (2010), *Doing work-based research – Approaches to enquiry for insider researchers*, Sage, London.
- Davenport, T. H. and Prusak, L. (2000), *Working knowledge: How organizations manage what they know*, 2nd ed, Harvard Business School Press, Boston.
- Denning, S. (2002), "Technical cooperation and knowledge networks", in Fukuda-Parr, S., Lopes, C. and Malik, K. (Eds.), *Capacity for development*, UNDP, New York, pp. 229-246.
- Ebner, M. and Reinhardt, W. (2009), "Social networking in scientific conferences – Twitter as tool for strengthen a scientific community", Workshop Science 2.0 for TEL, ECTEL 2009, available at: <http://elearningblog.tugraz.at/archives/2736> (accessed 5 June 2015).
- Edwards, B. (2002), "Deep insider research", *Qualitative Research Journal*, Vol. 2, No. 1, pp. 71-84.
- European Commission (2015), available at:
http://ec.europa.eu/growth/industry/corporate-social-responsibility/index_en.htm
 (accessed 23 March 2015).
- Federal Highway Administration (2015), available at:
<http://international.fhwa.dot.gov/scan/index.cfm> (accessed 7 February 2015).
- Fukuda-Parr, S. and Hill, R. (2002), "The network age: Creating new models of technical cooperation", in Fukuda-Parr, S., Lopes, C. and Malik, K. (Eds.), *Capacity for development*, UNDP, New York, pp. 185-202.
- Garavan, T. N. and McCarthy, A. (2008), "Collective learning processes and human resource development", *Advances in Developing Human Resources*, Vol. 10, No. 4, pp. 451-471.
- Gerson, D. and Kitchen, H. (2014), "Building Organisational Capacity for Public Sector Innovation", background paper prepared for the OECD Conference on Innovating the Public Sector: from Ideas to Impact, Paris, 12-13 November 2014.
- Gibbs, P. (2007), "Practical wisdom and the workplace researcher", *London Review of Education*, Vol. 5, No. 3, pp. 223-235.

- Glaser, B. G. and Strauss, A. L. (1967), *The discovery of grounded theory: strategies for qualitative research*, Aldine, Chicago.
- Global Development Network (2015), available at: <http://gdn.int> (accessed 15 February 2015).
- Gray, D. E. (2009), *Doing research in the real world*, 2nd ed, Sage, London.
- Guba, E. G. and Lincoln, Y. S. (2005), "Paradigmatic controversies, contradictions, and emerging confluences" in N.K. Denzin and Y.S. Lincoln (eds), *The Sage handbook of qualitative research*, Sage, London.
- Guest, G., MacQueen, K. M. and Namey, E. E. (2012), *Applied thematic analysis*, Sage, London.
- Hall, E. T. (1959), *The silent language*, Double Day, New York.
- Hall, E. T. (1969), *The hidden dimension*, Bodley Head, London.
- Hofstede, G. H. (1980), *Culture's consequences: International differences in work-related values*, Sage, Beverly Hills.
- Hofstede, G. H. (1994), *Cultures and organizations: Software of the mind: Intercultural cooperation and its importance for survival*, Harper Collins, London.
- Holden, N. (2002), *Cross-cultural management: A knowledge management perspective*, Financial Times Prentice Hall, Harlow.
- Holliday, A. (2007), *Doing and writing qualitative research*, 2nd ed, Sage, London.
- Honey, P. and Mumford, A. (1982), *Manual of learning styles*, P Honey, London.
- Jacobsen, D. I. (2005), *Hvordan gjennomføre undersøkelse? Innføring i samfunnsvitenskapelig metode*, 2. utgave, Høgskoleforlaget, Kristiansand.
- Johnsen, S. (2010), *Where good ideas come from: A natural history of innovation*, Penguin Group, New York.
- Kolb, D. A. and Fry, R. E. (1975), "Toward an applied theory of experiential learning", in Cooper, C. (Ed.), *Theories of group processes*, Wiley Press, London.

- Kolb, D. A. (1984), *Experiential learning: Experience as the source of learning and development*, Upper Saddle River, Prentice-Hall, New Jersey.
- Korea Development Institute and World Bank (2011), *Using knowledge exchange for capacity development: What works in global practice?*, World Bank, Washington D.C.
- Kvale, S. (2007), *Doing interviews*, Sage, London.
- León, L. R., Simmonds, P. and Roman, L. (2012): *Trends and Challenges in Public Sector Innovation in Europe*, prepared for the European Commission, Brussels.
- Letierce, J., Passant, A., Breslin, J. G. and Decker, S. (2010): "Using Twitter during an academic conference: The iswc2009 use-case", *Proceedings of the Fourth AAAI Conference on Weblogs and Social Media*, Washington D.C., May 23-26, 2010, AAAI Press, Menlo Park, California, pp. 279-282.
- Lewis, R. D. (2006), *When cultures collide: Leading across cultures*, 3rd ed, Nicholas Brealey International, Boston.
- Lunt, I. (2008), "Ethical issues in professional life", in B Cunningham (ed), *Exploring professionalism*, Institute of Education, London.
- Maxwell, J. A. (2005), *Qualitative research design: An interactive approach*, 2nd ed, Sage, London.
- McDermott, R. and O'Dell, C. (2001), "Overcoming cultural barriers to sharing knowledge", *Journal of Knowledge Management*, Vol. 5 No. 1, pp. 76-85.
- McNichols, D. (2010), "Optimal knowledge transfer methods: a Generation X perspective", *Journal of Knowledge Management*, Vol. 14 No. 1, pp. 24-37.
- Moustakas, C. E. (1994), *Phenomenological research methods*, Sage, London.
- Myers-Briggs Type Indicator – MBTI (2015), available at: <http://www.myersbriggs.org> (accessed 14 March 2015).
- Newell, S., Robertson, M., Scarbrough, H. and Swan, J. (2002), *Managing knowledge work*, Palgrave Macmillan, New York.

Nonaka, I. and Takeuchi, H. (1995), *The knowledge creating company: How Japanese companies create the dynamics of innovation*, Oxford University Press, New York.

Norwegian Data Inspectorate (2013), available at: <http://www.datatilsynet.no/English> (accessed 28 October 2013).

Norwegian Public Roads Administration (2009), *Policy for international activity*, Norwegian Public Roads Administration, Oslo.

Norwegian Public Roads Administration (2013), *Position paper on road traffic safety*, Norwegian Public Roads Administration, Oslo.

Organisation for Economic Cooperation and Development (2011a), *Joint workshop on knowledge sharing for development: Taking stock of best practices, Synthesis report*, OECD, Paris.

Organisation for Economic Cooperation and Development (2015), available at: <http://www.oecd.org/dac/governance-peace/governance/docs/46682429.pdf> (accessed 12 February 2015).

Panahi, S., Watson, J. and Partridge, H. (2013), "Towards tacit knowledge sharing over social web tools", *Journal of Knowledge Management*, Vol. 17 No. 3, pp. 379-397.

Polanyi, M. (1958), *Personal knowledge: Towards a post-critical philosophy*, University of Chicago Press, Chicago.

Polanyi, M. (1966), *The tacit dimension*, University of Chicago Press, Chicago.

Rashman, L., Withers, E. and Hartley, J. (2009), "Organizational learning and knowledge in public service organizations: a systematic review of the literature", *International Journal of Management Reviews*, Vol. 11 No. 4, pp. 463-494.

Riege, A. (2005), "Three-dozen knowledge-sharing barriers managers must consider", *Journal of Knowledge Management*, Vol. 9 No. 3, pp. 18-35.

Rivera-Vazquez, J. C., Ortiz-Fournier, L. V. and Flores, F. R. (2009), "Overcoming cultural barriers for innovation and knowledge sharing", *Journal of Knowledge Management*, Vol. 13 No. 5, pp. 257-270.

- Rolland, N. and Kaminska-Labbé, R. (2008), "Networking inside the organization: a case study on knowledge sharing", *Journal of Business Strategy*, Vol. 29 No. 5, pp. 4-11.
- Saetang, S., Theodoulidis, B. and Ekweozor, U. (2010), "The influence of knowledge ownership on knowledge sharing intentions: An empirical study in UK and Thailand", *The International Journal of Technology, Knowledge and Society*, Vol. 6 No. 2, pp. 17-30.
- Salskov-Iversen, D. (2006), "Learning across borders: The case of Danish local government", *International Journal of Public Sector Management*, Vol. 19 No. 7, pp. 673-686.
- Sandhu, M. S., Jain, K. K. and Ahmad, U. K. (2011), "Knowledge sharing among public sector employees: evidence from Malaysia", *International Journal of Public Sector Management*, Vol. 24 No. 3, pp. 206-226.
- Senge, P. (1990), *The fifth discipline: The art and practice of the learning organization*, Doubleday Currency, New York.
- Slowinski, G. and Sagal, M. W. (2010), "Good practices in open innovation", *Research-Technology Management*, September-October 2010, pp. 38-45.
- Smith, E. A. (2001), "The role of tacit and explicit knowledge in workplace", *Journal of Knowledge Management*, Vol. 5 No. 4, pp. 311-321.
- Smith, M. K. (2010), available at: <http://infed.org/mobi/david-a-kolb-on-experiential-learning> (accessed 23 May 2015).
- Stiglitz, J. E. (2000), "Scan globally, reinvent locally: Knowledge infrastructure and the localization of knowledge", in Stone, D. (Ed.), *Banking on knowledge: The Genesis of the Global Development Network*, Routledge. London, pp. 24-43.
- Stiglitz, J. E. (2002), "Knowledge of technology and the technology of knowledge: New strategies for development", in Fukuda-Parr, S., Lopes, C. and Malik, K. (Eds.), *Capacity for development*, UNDP, New York, pp. 271-280.
- The South-South Opportunity (2015), available at: <http://www.southsouth.info> (accessed 26 January 2015).
- Transportation Research Board (1995), *NCHRP Synthesis 216: Implementation of Technology From Abroad: A Synthesis of Highway Practice*, National Academy Press, Washington D.C.

Transportation Research Center (1992), *Transportation Technology Transfer: A Global Enterprise*, prepared for U.S. Department of Transportation, Federal Highway Administration and the Organisation for Economic Cooperation and Development, University of Florida, Gainesville.

Trompenaars, F. and Hampden-Turner, C. (1997), *Riding the waves of culture: Understanding cultural diversity in business*, Nicholas Brealey, London.

United Nations Committee of Experts on Public Administration (2006), *Definition of basic concepts and terminologies in governance and public administration*, United Nations Economic and Social Council, New York.

United Nations Development Programme (2015), available at:
<https://www.unteamworks.org> (accessed 15 April 2015).

United Nations Educational, Scientific and Cultural Organisation (2007), available at:
http://www.unesco.de/kronberg_declaration.html (accessed 7 April 2015).

VARK (2015), available at: <http://www.vark-learn.com> (accessed 11 March 2015).

von Krogh, G., Ichijo, K. and Nonaka, I. (2006), *Enabling knowledge creation: How to unlock the mystery of tacit knowledge and release the power of innovation*, Oxford University Press, New York.

Webster-Wright, A. (2009), "Reframing professional development through understanding authentic professional learning", *Review of Educational Research*, Vol. 29 No. 2, pp. 702-739.

Wellman, J. L. (2009), *Organizational learning: How companies and institutions manage and apply knowledge*, Palgrave Macmillan, New York.

Wenger, E. (1998), *Communities of practice: learning, meaning and identity*, Cambridge University Press, Cambridge.

World Bank (2011a), *Knowledge for development: The state of the World Bank knowledge services*, World Bank, Washington D.C.

World Bank (2011b), *Scaling up knowledge sharing for development: A working paper for the G-20 Development Working Group, Pillar 9*, World Bank, Washington D.C.

World Bank (2013), *The art of knowledge exchange: A primer for government officials and development practitioners*, World Bank, Washington D.C.

World Bank (2014), *The art of knowledge exchange: A results-focused planning guide for development practitioners*, World Bank, Washington D.C.

World Bank (2015), available at: <http://wbi.worldbank.org/wbi/approach/knowledge-exchange> (accessed 11 April 2015).

World Road Association (2014), *Young professionals survey*, World Road Association, Paris.

World Road Association (2015), available at: <http://www.piarc.org> (accessed 28 January 2015).

Yang, J. (2004), "Job-related knowledge sharing: comparative case studies", *Journal of Knowledge Management*, Vol. 8 No. 3, pp. 118-126.

Yu, Y., Wilkins, L. C. and Ma, W. W. K. (2003), *Developing an instrument for measuring knowledge sharing attitudes*, Hong Kong University of Science and Technology, Hong Kong.

Additional sources

Websites of international forums

American Association of State Highway and Transportation Officials:

www.transportation.org

Association for European Transport: www.aetransport.co.uk

Association of Southern Africa National Road Agencies: www.asanra.int.mw

Conference of European Directors of Roads (2013): www.cedr.fr

ERTICO – ITS Europe: www.ertico.com

European Association with Tolled Motorways, Bridges: www.asecap.com

Global Road Safety Partnership: www.grsproadsafety.org

Institute of Transportation Engineers: www.ite.org

International Association for Bridge and Structural Engineering: www.iabse.org

International Association of Public Transport: www.uitp.org

International Commission for Driver Testing: www.cieca.eu

International Federation for Structural Concrete: www.fib-international.org

International Federation of Automotive Engineering Societies: www.fisita.com

International Federation of Consulting Engineers: <http://fidic.org>

International Road Federation: <http://irfnet.org>

International Society of City and Regional Planners: www.isocarp.org

International Tunnelling and Underground Space Association: www.ita-aites.org

International Union of Laboratories and Experts in Construction Materials, Systems and Structures: www.rilem.org

Nordic Road Association: www.nvfnorden.org

Road Engineering Association of Asia and Australasia: www.reaaa.net

Standing International Road Weather Commission: www.sirwec.org

Transportation Research Board: www.trb.org

World Road Association: www.piarc.org

Appendices

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Appendix 1: 120-credit RAL claim at level 8 for advanced developments in professional practice

Title: Knowledge exchange between Nordic countries in the road transport sector

Introduction

This 120-credit RAL claim is based on advanced developments in professional practice that I achieved by managing a strategic development process of the Nordic Road Association (NVF). The role of the NVF is to facilitate knowledge exchange and promote developments in the road transport sector in the Nordic countries. The process was conducted as preparation for a new four-year work cycle and aimed at further developing the association's strategy and operations.

I was in charge of the process in the capacities of both director of international activities of the Norwegian road administration and secretary of the Norwegian chapter of the NVF. My experience from the road transport sector at the national and international levels combined with my skills in strategic planning and development, management, and leadership, enabled me to take the lead in the development process and make progress in my professional practice. From this work, I attained more insights into the issue of knowledge exchange between countries and its importance for the development of the road transport sector. I further developed my skills in process management, strategic organisational development, and research approaches.

A central question of the process was how to organise the exchange of knowledge. The process did not result in any significant change in the way of organisation the exchange. Conservative attitudes among stakeholders and lack of awareness of alternative methods and ways of working appeared to favour traditional approaches. While the process focused on facilitating knowledge exchange, it provided limited insights into the individual experience and views of those taking part in the exchange. I perceive a potential for getting more out of the learning and development opportunities that the exchange of knowledge provides for, and I am motivated to do further research on this topic. The following research project of my doctoral programme will focus on improving outcomes of the participation in international knowledge exchange and provide recommendations to that end. The experience and views of participants will make the key contribution in this work.

The end products of the work consisted of a new four-year strategic plan of the association accompanied by revised statutes and rules of procedure, and a communication policy. In addition, a renewed Memorandum of Understanding between the NVF and the World Road Association (WRA) was prepared as part of the work. These documents are appended as evidence to support the claim.

Contextual factors

The most important factors that shaped and influenced the process relate to my personal perspective, approach to practice and role in the process, and to the organisational and professional context.

I was appointed process manager in the position of the present secretary of the Norwegian chapter of the NVF and the next secretary general of the association. With only one year in this position, I was relatively new in the NVF in comparison with many of my colleagues who had been in the association for a number of years. I took on this task since it provided a good opportunity to make use of my knowledge and experience in international cooperation, get new insights into the work of an international organisation, and take my professional practice forward in the direction I wanted it to go.

I strongly believe in contact and cooperation between countries as a means of developing more effective policies and technical approaches by learning from successes and failures elsewhere. International cooperation is about receiving and giving, and this implies an ethical aspect. In my opinion, countries have a moral obligation to share their knowledge with each other. Organisations in different countries work under different external and internal conditions, but ideas and solutions of others can be adapted and applied in own working environments. Participants and organisations involved in international cooperation are eager to gain as much learning and professional development as possible, and it is therefore important to organise the cooperation in effective ways. A recent work carried by a working group of the Conference of European Directors of Roads (CEDR) serves as a good example of effective knowledge exchange. The working group, consisting of members of various countries, proposed actions for adapting the road network to climate changes based on good practices (CEDR, 2012). Several European national road administrations are now making use of this work in their efforts to adapt their roads to climate changes.

In this context, knowledge can be defined to include experience, information, facts, data and know-how. It is my experience that policymakers and practitioners want more than

explicit (codified) knowledge such as reports, books and other written materials. They also want to be connected to peers who face similar challenges in order to exchange tacit knowledge that is placed within people's heads and learn from practical experience. Such interaction can enrich the understanding of own circumstances, opportunities and constraints.

Tacit knowledge plays a key role in knowledge exchange processes. Studies have shown that managers in organisations get two-third of their knowledge and information from face-to-face meetings and phone conversations. Only one third comes from documents (Davenport and Prusak, 2000). The term tacit knowledge was first introduced by Polanyi in the late 50s (Polanyi, 1958), and his publication *The Tacit Dimension* (Polanyi, 1966) argues that tacit knowledge is a crucial part of scientific knowledge. In the 90s, Nonaka conducted research on knowledge sharing processes and developed a well-known model (SECI, Socialisation, Externalisation, Combination, Internalisation) which considers a spiralling knowledge process interaction between explicit and tacit knowledge (Nonaka and Takeuchi, 1995). The SECI model has been subject to further studies and systematic criticisms by several scholars, among others Adler (1995) and Gourlay (2003 and 2006). More recently, Nonaka has further developed the issue of knowledge conversion (Nonaka and von Krogh, 2009).

In my professional life, I have preferred roles and responsibilities that involve changes and development. I am concerned with setting strategic goals, improving work practices and searching for alternative approaches. From experiential learning and formal management training, I have gradually developed my ability to manage projects, processes, and people. In the context of knowledge sharing, human aspects and practices of people management have a central role. As shown by Cabrera (2003) and Cabrera and Cabrera (2005), the effectiveness of knowledge exchange is closely linked to people management practices.

I had a dual role as an insider-researcher in the process, which I found quite challenging. According to Costley et al. (2010), an insider-researcher needs to have a particular sensitivity to colleagues, acknowledge the culture, and show respect for the values of the organisation. I experienced both positive and negative implications of the dual role, including some ethical ones. It was an advantage to have inside knowledge about the association and easy access to all its members. On the other hand, it was at times a challenge to remain detached from the viewpoints, attitudes, and perspectives of others. As the association's next secretary general, I had a strong stake in the process and also

responsibilities towards the members after completion. As the process manager, I needed to be careful in the way I influenced the process and the other stakeholders. I had to act both autonomously and collaboratively and respect my own and others' opinions. It was particularly challenging to deal with some of the NVF committees because they protected their own spheres of work and felt somewhat threatened by the process. To avoid tensions and conflicts, it was important for me to communicate clearly to the NVF community, and to the NVF committees in particular, the aim of the process and my role in it.

The organisational and professional context was another important factor in shaping and influencing the process. It was located within the structure of the NVF which is quite complex. The NVF is a multidisciplinary organisation covering a wide range of road-related disciplines (Nordic Road Association, 2007). It has about 320 member organisations from both the public and private sectors. Work in the NVF is organised in four-year periods, and the chairmanship rotates among the member countries. Each member country has a national chapter that is affiliated with the association. The NVF is governed by the Board consisting of the chair, vice chair, and secretary of the national chapters. The chair, vice chair, and secretary in the country that has the chairmanship assume the roles of chair, vice chair, and secretary of the Board during the four-year period.

The secretaries of the national chapters comprise a Secretary Group that, under the leadership of the secretary general, is responsible for the on-going activities. A Communication Group is responsible for internal and external information and communication. The professional work of the NVF takes place within committees. Some committees have both a national and a Nordic level, while other committees exist only on the Nordic level. Each committee has a chair and a secretary. Chairmanship of the various committees is apportioned among the member countries.

Knowledge exchange in the NVF takes the form of peer-to-peer learning. Professionals from the various countries work together in committees within designated spheres of work for a four-year period. Committees hold regular internal meetings, and occasionally, they arrange open seminars in order to share knowledge outside of the NVF community.

The NVF is a long-established association, and its history dates back to 1935. Its culture and political climate is dominated by democratic decision-making and consensus seeking. At the outset of the process, it was my perception that the association was more concerned with traditions than with creativity and innovation. Its history, as documented in two publications (Nordic Road Association, 1995 and 2005), shows that the way of operating the

association has remained more or less unchanged since the beginning. Conservative attitudes were also dominating during the process, and from my point of view, this hampered the development of new thinking and ideas. An illustrative example of how conservative thinking prevented new development is the decision made to keep the existing spheres of work of committees. This decision made it difficult to develop the association in a new strategic direction.

Apart from the organisational structure, culture, and political climate of the NVF, the process had to take into account the development of the road transport sector in the Nordic countries. Organisation of the sector in the Nordic countries was showing growing coordination and harmonisation between different modes of transport. At the same time, there was a movement in some countries in the direction of greater regional and local influence on the development of the transport system.

The major organisational changes have taken place in Sweden and Finland. In Sweden (Statens offentlige utredningar, 2009), the road administration was merged with other transport administrations into a single transport administration with the view to obtain more integrated transport systems. A similar and parallel organisational change took place in Finland (Finnish Road Administration, 2009). Also in Iceland (Vegagardin, 2010) reforms were introduced, but the reform process was temporarily stopped due to the financial crises, and the merger of transport administrations took place later than foreseen. A public administration reform in Norway (Regjeringen St.prp.nr. 68, 2008) implied decentralisation of road ownership and responsibilities from the central to the county level. At the same time, the national road administration reinforced its responsibilities for urban transport, including public transport, biking, and walking. Denmark and the Faroe Islands were the only countries without significant reforms in the road management.

These reforms in the road management resulted in new roles and responsibilities of the road administrations and other actors in the sector. For the NVF, the reforms implied that a strategic decision had to be made as to whether the NVF should remain a road association or expand its focus to include other transport modes.

Research approach

Given the NVF structure, the process was organised as a combination of collaborative and consultative work. While the Secretary Group served as the project group and the Board as the steering group, member organisations and committees were involved on a consultative

basis. The NVF has hundreds of member organisations in six different countries that represent a diversity of cultures and perspectives. Their views needed to be respected and taken into account in the discussions and decision-making. Conflicts of interest had to be managed carefully in order to make decisions acceptable to the members. The outcome of the process – a new strategy – should allow all members to take part in the association's future activities.

I started the process by reviewing information on the subject of international knowledge exchange in order to expand my contextual knowledge and explore practices. Next, I organised exchanges of views and ideas in the Secretary Group that subsequently were presented to the Board for further discussion. Following these initial discussions, I drew up a project plan that included topics to be addressed in the process. Topics that emerged from the initial discussions called for a research approach focusing on exploring the stakeholders' views and opinions. Qualitative research is suited for exploring views of individuals and groups (Meeuwisse et al., 2010).

To collect data from member organisations and committees, a questionnaire survey was considered appropriate, since a large number of respondents spread all over the Nordic area should be reached. In the Secretary Group and the Board, I used a group-based method where the various topics were discussed until agreement was reached. In the following, the elements of the approach are discussed more in detail.

Review of information

I gathered information on approaches and kinds of knowledge exchange services from websites and corporate documents of other international road-related organisations. I was already familiar with the World Road Association (WRA) and the Baltic Road Association (BRA) with whom the NVF has cooperation agreements.

It was of particular interest to review approaches and practices of associations that, like the NVF, are multidisciplinary and operate at a regional level. The Road Engineering Association of Asia and Australasia (REAAA, 2007) has a similar aim as the NVF, but provides other kind of services to its members. It has a permanent secretariat that acts as a regional information centre, and it organises study tours and conducts research. Another organisation with a regional focus that I studied was the Association of Southern Africa National Road Agencies (ASANRA, 2009). This association differs from the NVF by having members only from national roads authorities and by focusing on training. ASANRA

identifies training needs and carries out skills development and training programmes for the region. In Europe, the most important multidisciplinary organisation is the Conference of European Directors of Roads (CEDR, 2008). CEDR also differs from the NVF by having members only from national road authorities. Apart from facilitating exchange of experience and information, CEDR further seeks to influence road transport policies of the EU.

Initial discussions in the Secretary Group and the Board

The discussions focused on the future strategic direction of the NVF in light of the recent reforms in the road transport sector in Nordic countries and on ways of organising the work and exchanging knowledge. From the discussions it became evident that there were different attitudes, perspectives, and standpoints and that I had to manage tensions and conflicting interests. All members of the Secretary Group and the Board recognised the need for renewing the NVF, but there were disagreements on the extent of changes. Some members were in favour of making radical changes while others were more conservative and concerned with traditions. These discussions turned out to be very useful as I got an overview of the thinking of the various members at an early stage.

Following the initial discussions, I prepared a project plan that included the following topics to be addressed:

- strategic direction and strategic themes
- committee structure and their spheres of activity
- methods and ways of working
- cooperation with other international organisations
- changes in statutes, rules of procedure, and policies (including language policy)

It was agreed that elements of the new strategic plan should be presented to the Board for decision rather than presenting drafts of the complete plan. This was considered the most flexible and adaptable way taken into account that the Board would only meet twice a year. As a way of keeping member organisations and committees informed about decisions taken during the course of the process, it was agreed to make minutes of Board meetings available to them.

Along with the preparation of a new strategic plan, the statutes, rules of procedure, and policies of the association had to be revised. After consultations with the Communication

Group of the NVF, it was agreed that this group would take care of merging the various policies into one new policy on communication to go with the new strategic plan. In order for the Communication Group to stay up-to-date on the process, the chair of the group was asked to attend meetings of the Secretary Group and the Board.

Collection of data from member organisations and committees

Data from member organisations and committees was collected using a questionnaire survey. Other methods such as interviews, workshops, and group discussions were considered but not used, since there were 320 member organisations and 16 committees spread all over the Nordic region. A questionnaire with standardised questions has the advantage of not risking interviewer bias, but on the other hand, there is no opportunity to ask follow-up questions and clear up ambiguous answers (Askheim and Grennes, 2008).

The questionnaire posed only open questions with no space limitations. While being aware that open questions are more difficult to analyse than closed questions, it was a wish to allow for diversity and richness in responses. Efforts were put into designing a questionnaire that should capture the opinions and views of the respondents on topics agreed upon by the Board. Before distribution, the questionnaire was piloted involving two former NVF committee members who were not part of the survey. Their review did not result in changes in the questionnaire.

The questionnaire was structured around topics that were deemed most important for the member organisations and committees:

- professional focus – roads or roads and other modes of transport
- committee structure and spheres of activity
- methods and ways of working
- language policy of the association – use of Scandinavian and/or English

It was distributed to member organisations and committees using email. One reminder was sent out. As the questionnaire targeted organisations and committees and not individuals, it was considered ethically acceptable that responses were not anonymous.

Analysis of data from member organisations and committees

The response rate to the questionnaire among the member organisations was around 30 percent. According to a study by Baruch and Holtom (2008), the average response rate for surveys used in organisational research was close to 36 percent when data was collected

from organisations. Compared to this finding, the response rate was quite satisfactory, but one could perhaps expect a higher rate in a survey within the NVF community. Among the committees, however, the response rate was 100 percent, and it demonstrated a strong interest in the NVF's work among the committees.

To facilitate the analysis, I used a common procedure for qualitative analysis as outlined by Fejes and Thornberg (2009). I organised the responses in a table that could be sorted by respondent and question. I then coded the responses into categories. From the categories, I identified key themes in each question. The questionnaire was summarised question by question to illustrate the key themes in each question. From the analysis, it was possible to see similarities and differences in opinions both between and among member organisations and committees. I had one person from the Secretary Group to review and check the analysis.

Discussions and decisions

The initial discussions in the Secretary Group and the Board and the responses from the questionnaire survey among member organisations and committees formed the basis for further discussions and decision-making.

The discussions in the Secretary Group and in the Board were structured around the topics agreed upon during the initial discussions. I found it challenging to make the Secretary Group agree on solutions that would accommodate the views of most stakeholders. Also in the Board there were disagreements, and it was necessary for the Board members to make compromises in order to reach decisions.

Strategic direction and strategic themes

As regards the professional focus of the association, most stakeholders were of the opinion that the NVF should not deal with roads only, but also with more integrated transport systems. It was noted that some committees (strategic planning, urban transport, ITS, tunnels and bridges) were already dealing with other modes of transport. However, it was considered premature to transform the NVF from a road association into a transport association, and the decision of the Board was to maintain the road association but with an increased emphasis on integrated transport systems.

The Board adopted four new strategic themes to govern the NVF activities that represented key issues for the sector as a whole and reflected trends and challenges in the Nordic

countries. These themes comprised safe and environmentally sound transport systems, quality and resource optimisation in transport systems, competent and efficient organisations, and innovation and renewal. Committees were to take all four strategic themes into account in their activities in order to ensure a comprehensive and integrated approach.

Committee structure and spheres of activity

In the existing NVF structure, most committees have both a national and a Nordic level, while a few committees exist only on the Nordic level. The committee structure and their spheres of activity were subject to lengthy discussions. As regards the committee structure, most stakeholders were in favour of keeping the existing structure, but with more emphasis on cooperation at the Nordic level. It was felt that too much focus was placed on national level cooperation. A minority of the stakeholders wanted a radical change in the structure replacing all national committees by Nordic committees with the view of reinforcing the Nordic perspective of the activities.

The stakeholders were more in disagreement concerning the spheres of work. Some stakeholders, particularly the committees, wanted to keep the existing spheres of work, while others were in favour of creating new committees with new spheres of work to better reflect the new strategic direction and the integrated transport approach. The Board feared that ignoring the views of committees could potentially lead to loss of members. It was thus decided not to alter the committees' spheres of activity. In my opinion, this decision was a setback, since it would hamper the development of the association in the strategic direction agreed upon.

Methods and ways of working

Work in committees is the core of the NVF's activities, as it involves peer-to-peer learning. The questionnaire survey showed that most committees and member organisations wanted to keep the existing methods and ways of working in committees. Some of them argued, however, that the NVF should find new ways to facilitate the exchange of knowledge.

Traditionally, NVF committees have not been provided with terms of reference for their work in the four-year period. Committees have defined their work in concrete terms within their designated spheres of activity and prepared a four-year work plan for approval by the Board. It has been assumed that committees consist of professionals who are well equipped for defining their own terms of reference. This is different from the way most

other international organisations, such as the WRA (2008) and CEDR (2008), operate where committees are given a concrete mandate. The survey clearly showed that there was a wish to keep the traditional arrangement, and the Board's decision was therefore not to change or modify it.

Another issue that needed to be sorted out was the kind of activities to be carried out by committees. In the survey, some committees expressed a wish to add new activities such as research and development projects and scanning tours. The Board, however, rejected the proposals and encouraged committees to identify possible research and development projects for implementation in other forums. Following the Board's decision, the focus of committee work should still be on exchanging knowledge and building networks through committee meetings and open seminars.

The questionnaire survey further revealed some conflicting views on committee composition. I recommended to the Board that guidelines should be developed on the recruitment of committee members. In this regard, it was important to take the new strategic themes into account and recruit members working with other transport modes than roads. Guidelines were developed in accordance with the new strategy direction and integrated into the strategic plan.

Cooperation with other international organisations

The NVF aims to position itself in the international community in order to promote Nordic interests and priorities and influence developments in the road transport sector.

The NVF has a long-standing cooperation with the World Road Association (WRA) and the Baltic Road Association (BRA) that also promote development in road transport policy and practices through cooperation and knowledge exchange between professionals from different countries. The cooperation is formalised through a Memorandum of Understanding. When preparing the new strategy of the NVF, it was necessary to assess the future relations with these organisations.

The cooperation with the WRA gives access to networks, information, and knowledge worldwide, and the opportunity to take part in and influence the developments at the global level. It further provides for secondment of staff members of NVF countries to the WRA secretariat. I was well positioned to assess the benefits and value of the secondment arrangement, since I had been seconded to the WRA some years back. Seconded staff members including myself had all benefitted both professionally and personally from their

secondment, and with a few exceptions, they were all still involved in international work in one way or the other. I was strongly in favour of continuing the cooperation with the WRA and advised the Board accordingly. There were no negative attitudes among the Board members towards the secondment scheme as such, but for some countries, it was a question of funding. Only three of the NVF countries (Finland, Norway and Sweden) agreed to continue seconding staff members to the WRA.

With the Board's decision to continue the cooperation with the WRA, I became responsible for negotiating a renewed Memorandum of Understanding. There was a wish of both associations to have closer contacts between their respective committees, but they were in disagreement on how to arrange such contacts. While the WRA preferred to formalise committee cooperation through annual action plans, the NVF did not want to impute formal cooperation to its committees. This disagreement caused some tensions between the parties. The new agreement was eventually signed without including formal cooperation between the committees.

As regards the NVF-BRA cooperation, it has found its expression in a joint seminar programme and joint meetings of the Boards and Secretary Groups. Experience in recent years has shown, however, that the basis for formalised cooperation is not present to the same extent as it was previously. The general opinion within the NVF was that the cooperation with the BRA was no longer strategically and technically important. I facilitated meetings between the Boards of the two associations to discuss their future relations. Fortunately, the associations agreed on continuing the cooperation more informally and organise joint seminars and other events when the need arises.

Changes in statutes, rules of procedure and policies

Changes in statutes and rules of procedures were made in accordance with the Board's decisions. There was a demand for a new communication policy in particular. The Communication Group in consultation with the Secretary Group developed a new communication policy, including a language policy, describing different types of communication and communication tools to be used in NVF activities.

As regards the language policy, the questionnaire survey showed that there was a positive attitude among member organisations and committees towards more use of English in committee work, and particularly among members in Finland and Iceland who do not have any of the Scandinavian languages (Danish, Norwegian and Swedish) as their native

language. The existing language policy was in line the convention of the Nordic Council (Nordisk råd, 2007) as concerns the mixed use of Scandinavian languages. A revised policy should, however, ensure that members from Finland and Iceland were not excluded from taking part in NVF activities because of language barriers. It was further argued that more use of English is important for the NVF's contact with other international organisations that requires use of English in reports, seminars, websites etc. The new language policy endorsed by the Board provides for more flexibility in the use of language and more use of English.

Dissemination of outcomes

All members were kept informed about decisions made during the process. The new strategic plan together with revised statutes and rules of procedures, and the new communication policy were sent to member organisations and committees upon completion, and also placed on the NVF website. The new strategic direction was highlighted when disseminating the documents. The documents were to support member organisations in their appointment of members to the committees in the coming work cycle.

I further presented the outcomes of the process orally at meetings between the Board and committees during the preparation of the new four-year period. At these meetings, I facilitated an exchange of views on the process. It appeared that most people were satisfied with the process that allowed all stakeholders to express their opinions, although they were not equally satisfied with the result.

Critical evaluation

The combined collaborative and consultative approach used in the process has many advantages. By giving all parts of the association a voice in the process, it created feelings of ownership and built trust. This was confirmed when I presented the final result of the process. The approach also provided access to a range of views and opinions.

The group-based method applied by the Secretary Group and the Board took the form of discussions around key topics in which the members presented their viewpoints and discussed the views and opinions collected from member organisations and committees. This was the preferred method of working among the members, and I felt they were willing to compromise and accept decisions they did not fully agree to. I experienced, however, that it was difficult for some members to maintain the commitment and interest during the

entire period of two years. I did not experience any particular problems in facilitating the discussions in the Secretary Group and the Board. I found it, however, hard at times to handle my insider-researcher role. As the next secretary general, I was very focused on the implications of the decisions, and I had to be careful not to go too far in promoting my own standpoints.

Member organisations and committees were given a voice by responding to a questionnaire. Although they did not take part in discussions to find solutions, their views were taken into account. They were kept continuously informed about decisions made by the Board. While all committees responded to the questionnaire, the response rate from member organisations was around 30 percent. I believe a higher rate could have been achieved by providing more information on the process before distributing the questionnaire.

At the outset, I expected the process to create more changes to the ways of working and exchanging knowledge than what was attained. It is my understanding that the reasons for not achieving major changes were the conservative attitudes of many NVF members combined with a lack of awareness on alternative ways of working and exchanging knowledge. People's attitudes are hard to change, but the result could have been different if more efforts had been put into raising awareness of various options among the secretaries and the Board members and also among member organisations and committees.

In addition to informing member organisations and committees prior to sending the questionnaire, the questionnaire survey could have been combined with interactive methods of data collection such as group interviews, workshops, and focus groups. Such methods would allow for generation of new thinking, ideas, and solutions.

Further research

The NVF process gave me valuable insights into the facilitation of knowledge exchange of an international organisation and experience in being an insider-researcher. It further gave me new learning on research design and methodology. I wish to continue researching the issue of knowledge exchange, since I have a perception that there is a potential for getting more out of the learning and development opportunities that international exchange of knowledge offers.

While the NVF process dealt with facilitation of knowledge exchange, the following research project of my doctoral programme will address the issue of how to improve outcomes of the participation in international knowledge exchange. To that end, I wish to examine experience and views of individuals taking part in knowledge exchange. I will use the findings to produce recommendations for how to enhance benefits that can be used to guide policies and practices. In the research project, I will make use of the main learning from the NVF process about applying appropriate research methods.

The research will add value primarily to my organisation and its participants in knowledge exchange, but it will also be of interest and relevance to other nations' road transport organisations that engage in knowledge exchange with other countries as well as to the NVF and other international organisations, networks, and forums that have a facilitating role.

References

- Aas Askheim, O. G. and Grennes, T. (2008), *Kvalitative metoder for markedsføring og organisasjonsfag*, Universitetsforlaget, Oslo.
- Adler, P. S. (1995), "The dynamic relationship between tacit and codified knowledge: Comment on Nonaka", In Allouche, J., Pogorel, G. (eds.), *Technology Management and Corporate Strategies: A Tricontinental Perspective*, Elsevier, Amsterdam, pp. 110-124.
- Association of Southern Africa National Road Agencies (2009), *Strategic and business plan 2009-2014*.
- Baruch, Y. and Holtom, B. C. (2008), "Survey response rate levels and trends in organizational research", *Human Relations*, Vol. 61 No. 8, pp. 1139-1160.
- Cabrera, E. F. (2003), "Socio-psychological aspects of knowledge sharing in organizations", paper presented at the 7th Conference on International Human Resource Management, Limerick, Ireland.
- Cabrera, A. and Cabrera, E. F. (2005), "Fostering knowledge sharing through people management practices", *International Journal of Human Resource Management*, Vol. 16 No. 5, pp. 720-735.
- Conference of European Directors of Roads (2008), *Strategic plan 2009-2013*.
- Conference of European Directors of Roads (2012), *Adaption to climate change*.
- Costley, C., Elliot, G. and Gibbs, P. (2010), *Doing work-based research – Approaches to enquiry for insider researchers*, Sage, London.
- Davenport, T. H. and Prusak, L. (2000), *Working knowledge: How organizations manage what they know*, 2nd ed, Harvard Business School Press, Boston, MA.
- Fejes, A. and Thornberg, R. (2009), *Handbok i kvalitativ analys*, Liber, Stockholm.
- Finnish Road Administration (2009), *Transport administration under reform*.
- Gourlay, S. (2003), "SECI model of knowledge creation: Some empirical shortcomings", paper presented at the 4th European Conference on Knowledge Management, Oxford, England, 18-19 Sep 2003.

- Gourlay, S. (2006), "Conceptualizing knowledge creation: A critique of Nonaka's theory", *Journal of Management Studies*, Vol. 43 No. 7, pp. 1415-1436.
- Meeuwisse, A., Swärd, H., Eliasson-Lappalainen, R. and Jacobsen, K. (2010), *Forskningsmetodikk for sosialvitere*, Gyldendal akademisk, Oslo.
- Nonaka, I. and Takeuchi, H. (1995), *The knowledge creating company: How Japanese companies create the dynamics of innovation*, Oxford University Press, New York.
- Nonaka, I. and von Krogh, G. (2009), "Tacit knowledge and knowledge conversion: Controversy and advancement in organizational knowledge creation theory", *Organization Science*, Vol. 20 No. 3, pp. 635-652.
- Nordic Road Association (2005), *Nordic Road Association 1935-2005*.
- Nordic Road Association (2007), *Strategic plan 2008-2012*.
- Nordisk råd (2007), *Deklarasjon om nordisk språkpolitikk*, Nordisk råd, København.
- Nordisk Vegteknisk Forbund (1995), *Nordisk Vegteknisk Forbund 1935-1995*.
- Polanyi, M. (1958), *Personal knowledge: Towards a post-critical philosophy*, University of Chicago Press, Chicago.
- Polanyi, M. (1966), *The tacit dimension*, University of Chicago Press, Chicago.
- Regjeringen St.prp.nr. 68 (2008), *Kommuneproposisjonen 2010*.
- Road Engineering Association of Asia and Australasia (2007), *Strategic plan*.
- Statens offentlige utredninger (2009), *N 2009:06 Inrättande av den nya myndigheten Trafikverket*.
- Vegagardin (2010), *Omorganisering*.
- World Road Association (2008), *Strategic plan 2008-2011*.

Appendix 1: Portfolio of evidence

1. Nordic Road Association (2011): Strategic Plan 2012-2016
2. Nordic Road Association (2011): Communication Policy 2012-2016
3. Nordic Road Association (2011): Statutes
4. Nordic Road Association (2011): Rules of Procedure
5. Memorandum of Understanding between the World Road Association and the Nordic Road Association (2012)

Appendix 2: Kind and range of knowledge exchange services of international forums

Service / Forums	Congresses, conferences, symposiums, seminars, workshops	Committees, working groups	Cooperation projects	Study tours	Provision of training courses and/or materials	E-learning, online learning, web based training courses	Provision of publications	Dynamic website	Social media, web based and video communications technologies
Association for European Transport	Conferences						Newsletter	Dynamic website	
ERTICO – ITS Europe	Congresses, conferences, workshops		Initiation of joint research projects				Magazine, Newsletter	Dynamic website	
European Association with Toller Motorways, Bridges	Congresses, ad hoc events		Participation in research and development projects				Newsletter, bulletin	Dynamic website	
American Association of State Highway and Transportation Officials	Meetings, conferences	Committees	Running of research and development programmes		Educational programmes		Technical standards, guides, manuals, reports, books, journal, newsletter	Dynamic website	Social media, transportation TV
Association of Southern Africa National Road Agencies	Conferences, seminars, workshops	Committees	Projects for guidelines development		Training programmes		Guidelines, reports, newsletter	Dynamic website	

Conference of European Directors of Roads	Conferences	Working groups	Coordination of joint research and development projects				Technical reports	Dynamic website	
Nordic Road Association	Congresses, seminars	Committees					Technical reports, newsletter	Dynamic website	Social media
Road Engineering Association of Asia and Australasia	Conferences, seminars, workshops		Conduction of research and development projects	Study tours, technical visits			Technical reports, circulars	Dynamic website	
Transportation Research Board	Meetings	Committees, panels, task forces	Management of research and development projects				Technical reports, books, manuals, guides, circulars, journal, newsletter	Dynamic website	Webinars
Global Road Safety Partnership	Seminars		Running of global and special programmes				Reports, manuals, newsletter	Dynamic website	Social media

International Association for Bridge and Structural Engineering	Conferences, symposiums	Committees	Conduction of research activities		Training programmes	E-learning	Technical reports, bulletin, newsletter	Dynamic website	
International Association of Public Transport	Congresses, conferences, seminars, workshops	Special interest councils	Conduction of studies, projects, surveys	Study tours	Training programmes		Technical reports, guides, magazine, newsletter	Dynamic website	
International Commission for Driver Testing	Congresses, seminars, workshops	Permanent and temporary topic groups	Conduction of studies and projects		Training materials		Technical reports, guides, newsletter	Dynamic website	
International Federation for Structural Concrete	Seminars, workshops	Task groups, special activity groups	Dissemination of research results		Training courses		Technical reports, manuals, guides, journal, newsletter	Dynamic website	
International Federation of Automotive Engineering Societies	Congresses				Educational resources		Technical reports, books, standards, magazine, newsletter	Dynamic website	Social media
International Society of City and Regional Planners	Congresses, conferences, seminars, workshops			Study tours			Technical reports, manuals, guidelines	Dynamic website	Social media
International Tunnelling and Underground Space Association	Congresses	Working groups, committees			Training workshop, academic programmes		Technical reports, manuals, newsletter	Dynamic website	Social media

International Union of Laboratories and Experts in Construction Materials, Systems and Structures	Conferences, workshops								Technical reports, journal, newsletter	Dynamic website	
Standing International Road Weather Commission	Conferences								Technical reports	Dynamic website	
International Federation of Consulting Engineers	Conferences, seminars, workshops							Training courses	Standards, guidelines, manuals, newsletter	Dynamic website	Social media
International Road Federation	Conferences, seminars, workshops							Training courses	Training materials, magazine, bulletin, newsletter	Dynamic website	Social media
Institute of Transportation Engineers	Meetings								Online community discussion, web based courses	Dynamic website	Social media
World Road Association	Congresses, seminars, workshops		Special topic projects						Reports, manuals, magazine, newsletter	Dynamic website	

Examples of goals of specialised forums:

Global Road Safety Partnership (GRSP): improving road safety and saving lives

ERTICO - ITS Europe: facilitating the safe, secure, clean, efficient and comfortable mobility of people and goods in Europe

International Association for Bridge and Structural Engineering (IABSE): advancing the practice of structural engineering

International Tunnelling and Underground Space Association (ITA): encouraging new uses of underground space for the benefit of the public, environment, and sustainable development

International Commission for Driver testing (CIECA): improving driving standards, contributing to road traffic education, improving road safety, protecting the environment and facilitating the mobility of road freight and passenger transport, both private and commercial

Examples of goals of multidisciplinary forums:

Conference of European Directors of Roads (CEDR): improving the road system and its infrastructure

American Association of State Highway and Transportation Officials (AASHTO): fostering the development, operation, and maintenance of an integrated national transport system

Association of Southern Africa National Road Agencies (ASANRA): developing more effective policies and technical approaches and improving professional and technical capacity to service the roads sector leading to more efficient delivery of road infrastructure

Road Engineering Association of Asia and Australasia (REAAA): promoting and advancing the science and practice of road engineering and related professions

World Road Association (WRA): developing better performing, safer and more sustainable road use and road transport

International Road Federation (IRF): promoting the development and maintenance of better, safer and more sustainable roads and road networks

Appendix 3: Semi-structured interview guide

Interview information

Date Time Interviewee no

Participant's profile

Gender

Female Male

Educational degree

Bachelor's degree Master's degree Doctoral degree

Field of study

Technology Economy Social sciences Other

Professional discipline

...

Years of work experience

0-10 10-20 20-30 30-40 40-

Years of participation in international knowledge exchange

0-2 2-4 4-6 8-10 10-

International forum(s) and/or bilateral cooperation in which the interviewee participates

...

Knowledge exchange methods with which the participant has experience

- Staff exchanges and secondments
- Cooperation projects
- Committee work, working groups
- Conferences (include all forms of event such as congresses, seminars, workshops)

- Study tours
- Other

Introductory questions

- 1 - What is your most useful experience with the exchange and why?
- 2 - What is your least useful experience with the exchange and why?

Questions about the experience with methods used in the knowledge exchange

- 3 - What are the most effective methods you have experienced?
- 4 - What are the least effective methods you have experienced?

Questions about the impact of the knowledge exchange on the participants and their organisation

- 5 - What is the impact of the exchange on your professional development?
- 6 - How can higher impact on your professional development be achieved?
- 7 - How do you share and disseminate knowledge acquired in your organisation?
- 8 - How do you think more sharing and dissemination of knowledge can be achieved?
- 9 - How is the knowledge applied in your organisation?
- 10 - How can more use of the knowledge in your organisation be achieved?

Questions about problems and barriers in the knowledge exchange

- 11 - What factors do you think create problems and hamper the exchange and why?
- 12 - How are the problems and barriers managed?
- 13 - What can be done to remove or reduce the problems and barriers?

Question about changes or actions that can yield better results of the knowledge exchange

14 - What can you do to get more out of your participation and how?

15 - What can your organisation do to get more out of your participation and how?

16 - What can international forums do to better facilitate the exchange and how?

Final question

17 - Open question

Appendix 4: Letter to prospective interviewees

I am undertaking a research project of a Doctorate in Professional Studies at Middlesex University, London. The project's purpose is to improve outcomes of international knowledge exchange among road transport professionals.

I would like to invite you to take part in the project, since you are involved in cooperation and knowledge exchange with other countries. I would like to carry out an interview with you with the objective to collect information on your experience and views related to the exchange of knowledge. It will be a semi-structured interview that will take about 1 hour to complete. I attach a guide outlining the interview questions.

You will be anonymous in the project and all data and information you provide, will be treated with full confidentiality. The project has gained ethical approval of the University ethics committee and has been notified to the Norwegian Data Inspectorate.

The participation is voluntary and you may withdraw your consent as long as the project is in progress, without stating the reason.

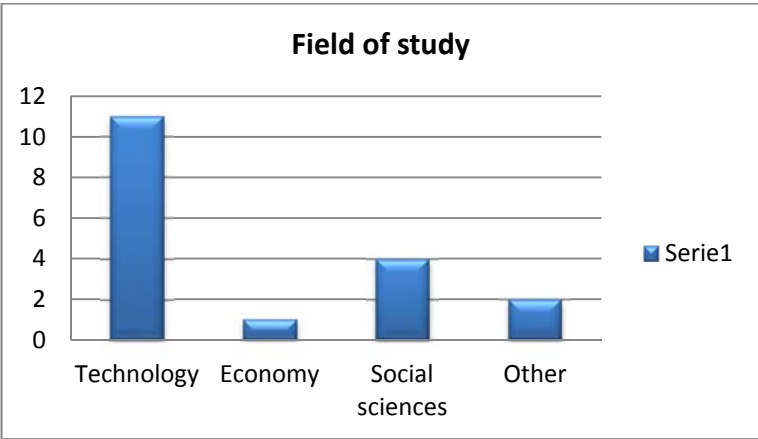
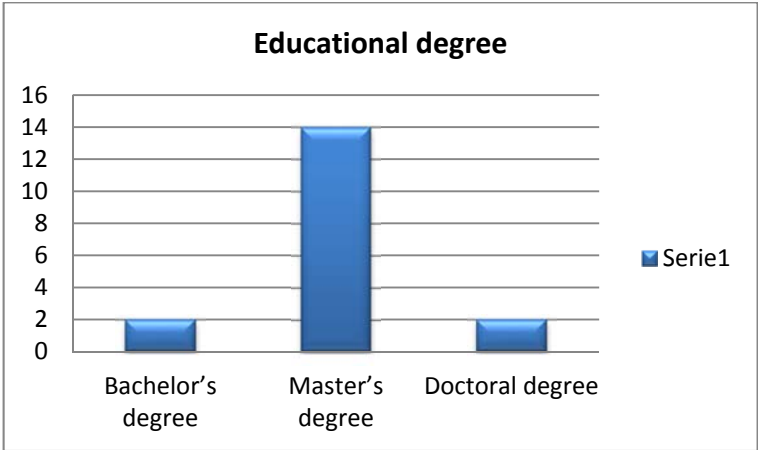
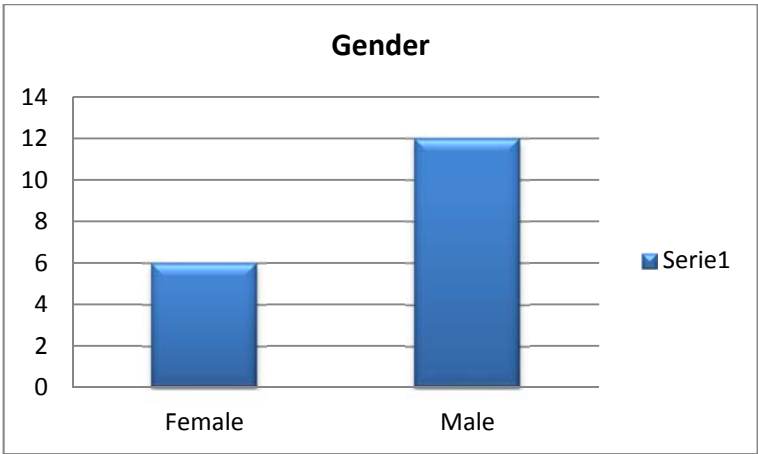
If you have any queries regarding the project, please contact me.

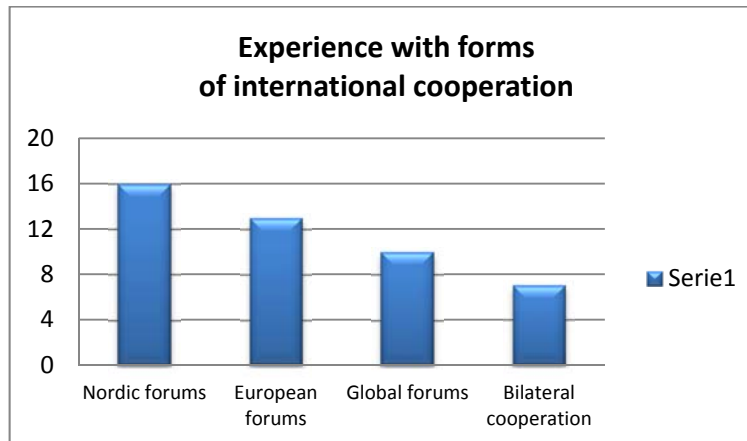
Written consent:

I have received written information, and I am willing to participate in the project.

Signature and date

Appendix 5: Profiles of interview participants





Appendix 6: Extract of coded interview transcripts

P#-Q#	Question	Response segment	Codes		
			group discussion over time	exchange of existing knowledge	partners with similar challenges
P1-Q1	Can you tell me about your most useful experience with the knowledge exchange?	I think that I benefit most from the informal dialogue that I have with other members of my NVF-committee from other countries. I learn about what is going on within research and development, development of standards, how they deal with regulations and other things. These short and frequent exchanges are very useful. It is also interesting to learn about recent results of research in the other countries and to assess how they can be utilised in Norway. So this continuous dialogue with peers in the NVF-committee, who work within my field in similar organisations, is the most useful experience. One example can be listening to presentations at conferences that have little to do with my work. But this does not happen to me very often.	group discussion over time	adaptation of knowledge	
P1-Q2	What would you say is your least useful experience from the exchange?		relevance	choice of method/activity	
P2-Q3	What is your least useful experience from the exchange?	In the NVF, we wanted to carry out a cooperation project on best practices in the Nordic countries. But we had to drop this idea since no one had time for such a project. It requires a project manager who can dedicate some time to manage the project, but no one was available to take on that responsibility. Now we rather focus the committee work on organising the annual bridge conference, and that takes considerable time too. It is definitely the annual bridge conference that is most beneficial for me. At these conferences, there are short and to-the-point presentations. It is very easy to contact the speakers if I want to know more about an issue. It is also easy to get in touch with other attendees since the conference gathers some 100 people only.	time available for exchanges		
P2-Q4	Which methods are most effective according to your experience?		relevant technical focus	listening to presentations	
			personal contact	group size	
P3-Q5	What do you think is the impact of the exchange on your professional development?	I have learned a lot over the years. I have become much more confident professionally, and I feel up-to-date within my domain. My knowledge base has expanded, and I have been reassured concerning my own knowledge. I have for example acquired much knowledge from Denmark on tunnel lighting technologies and taken part in the introduction of new practices on such technologies in Norway. I would have to spend some time abroad in an organisation or in a professional environment specialised in my field of work. This could have been an excellent learning opportunity if I were younger. I believe in staff exchanges as a means of professional development.	professional and personal growth	partners with similar challenges	participant's influence
P3-Q6	How can higher impact on your professional development be achieved?		exchange of existing knowledge	explicit application	professional growth

PS-Q7	How do you share and disseminate outcomes of the exchange in your professional community and in your organisation?	I tell my colleagues about what I have experienced and learned provided that I think it is of interest to them. I usually share information orally within my unit, but I wrote a report from the study trip.	Informal oral sharing with colleagues	Written sharing		
PS-Q8	How do you think more sharing and dissemination of outcomes can be achieved?	I should spend more time on this. The problem is that it is quite hectic at work, and I sometimes forget to share and disseminate information that can be of use to others. In addition, I should become better at sharing information to the external professional community.	Time available for sharing	reluctance to sharing		
PS-Q9	How are the outcomes applied in the professional community and in the organisation?	My knowledge is used for benchmarking with other countries. It is also used in the work on the National Transport Plan where we look at other countries. As an example, we are going to study road standards in relation to traffic volumes in other European countries. In this work, we will benefit from the CEDR-work and my international network. But I think there is still more that we could do in this respect.	explicit application			
PS-Q10	To what extent do you see a connection between your international work and the work you do at home?	The work in CEDR is very relevant and in line with our priorities at home.	Integration of knowledge exchange			
PS-Q11	How are the outcomes applied in the professional community and in the organisation?	I have been able to incorporate much of my learning and knowledge from abroad into handbooks and other documents, for example within Incident Management and ITS. I will also point at the Datax project that we started in the 90s when we signed a European agreement on the exchange of traffic data using the Datax standard. Then there was a long period where nothing happened. We took up the working later, and this year we are going to deliver the system for dynamic data management. This has taken a long time, but now we are there.	participants' influence	adaptation of knowledge	explicit application	
PS-Q12	How do you think more use of the outcomes can be achieved?	In my professional community I experience some scepticism when it comes to using experience from abroad in our work. We need to be more open-minded and inquiring about other countries' experience. This is about attitudes.	attitudes to knowledge from abroad			

P7-Q13	What can the professional community and the organization do to get more out of your participation?	As I said, we need a strategy for the international work, and to integrate the work into the national work in a better way.	strategies for knowledge exchange	integration of knowledge exchange	
P7-Q14	What can international forums do to better facilitate the exchange?	In the NVF-committee, it was difficult to administer contact and cooperation across committees and across countries as we were asked to do. It should not be organized in this way. It is much better for the committees to focus on their specific task, and to develop stronger contact and network between the committee members. It works well in my RAC-committee, but the progress is slow. I find it very useful to produce a joint report as we do in the committee. It provides more in-depth learning. What I do not like is the WEA bulletin magazine. It disturbs me when there is English and French text on the same page, and I do not read it. I wish they could send me the magazine electronically in English only.	inter-group cooperation group discussion overtime language challenges	exchange of existing knowledge use of ICTs	joint report writing
P8-Q15	What can you do yourself to get more out of your participation?	I should discuss the need for more time with the head of section. I have already started thinking about it.	time available for exchanges		
P8-Q16	What can the professional community and the organization do to get more out of your participation?	I have told my boss that I think we should have a clear strategy for our participation at the TSE. We need to be more conscious about what we want to achieve and the time it takes. I have seen that people have been sent to the conference simply as a kind of remuneration for good work.	strategies for knowledge exchange		
P9-Q17	Is there anything more you would like to say about your participation in knowledge exchange with other countries?	As I said, I think that the road administration is a good organisation that provides for many opportunities for professional and personal development through international participation. This is more important for people like me who carry out research and development work than what it is for other categories of personnel.	increased job satisfaction	need for knowledge from abroad	
P10-Q1	Can you tell me about your most useful experience with the knowledge exchange?	What I think has been most useful is to meet people - that is important. To take part in knowledge exchange also gives me an overview of what is going on within my field. It is an easy way to learn something new. It has also been interesting to see where we stand internationally, and have seen that we are doing fairly well. I further get the opportunity to present my work and get feedback, and that is very useful. I learn in fact most from presenting as I have to use and structure everything I know. My least useful experience is to listen to people giving presentations in bad English. I do not really catch what they talk about. If they have good power points it works in a way. There is no point going to an international conference if you cannot understand what the speakers say.	personal contact keeping pace with developments giving presentations language challenges		
P10-Q2	What would you say is your least useful experience from the exchange?				

FI1-Q3	Which activities have not been relevant for you?	I cannot recall anything specific. But I have been to conferences where some sessions have been of little interest. And so one year ago I was to take part in a CEDR-project. We thought the project was about road operations, but that was a misunderstanding. At the first meeting, I found that the project was about traffic operations, and that is not my field. This was my only meeting in this project.	relevance	choice of method / activity	
FI1-Q4	Which methods do you think are the most effective?	I have benefited most from taking part in projects and in committee work of international organisations, but conferences are useful too.	group discussion over time	listening to presentations	
FI2-Q5	Which methods do you think are the most effective?	I prefer methods where I get in close contact with other professionals, and I benefit most from taking part in small forums and groups with few people.	personal contact	group size	
FI2-Q6	How do you consider long-term activities compared to short-term activities?	I would say that long-term work such as taking part in a CEDR working group over a period of four years is more effective. My experience from CEDR is that I expanded my knowledge gradually and got to know the other group members well. But it took some time before I felt safe and confident in the group.	group discussion over time	exchange of existing knowledge	network-building
FI3-Q7	What is your experience with study trips in terms of effectiveness?	I will probably get more out of a study trip than of a conference, as long as the study trip is well organised. I have only been on one study trip, and that was successful. I went with a small group of colleagues, and we had a very compact programme. We made very good contact with the various people we met. So, if I should choose between a study trip and a conference, I would go for the former.	one-time group discussion	seeing solutions	personal contact
FI3-Q8	What do you think is the impact of the exchange on your professional development?	My participation in the standardization work of CEN and in committee work of the NVF has been of great value to me. By taking part in a CEN-committee, I got first-hand information on the development of standards with in my field in Europe. I also have the opportunity to influence the work in such a way that the standards fit for example, the equipment we use in Norway for measuring pavement conditions. I feel quite influential when I take part in this CEN-work. In addition to the technical work, I get a lot of information on different things going on such as on-going and upcoming European projects. In the NVF, I have been chairing working groups, and that is a very useful experience. I have also become more experienced in giving presentations at various events. My professional network has expanded to include people working in both the private and public sector in different countries.	professional growth		
			personal growth		
			giving presentations	professional growth	

P14-Q9	How can higher impact on your professional development be achieved?	Then I would have to spend more time after meetings and other events, for example when I get back from a meeting in the WRA committee. During such meetings, I take notes of things to study more closely when I get back, but I never do that. There is so much information that I never have time for in-depth studies.	time available for exchanges		
P14-Q10	How do you share and disseminate outcomes of the exchange in your professional community and in your organisation?	I do it while carrying out my tasks since I have a function in which I can make use of what I learn from my international work. But when it comes to more formal forms of sharing and disseminating information and knowledge, it is not very structured.	In formal oral sharing with colleagues	to formal oral sharing in various forums	
P15-Q11	How do you think more sharing and dissemination of outcomes can be achieved?	It could be considered putting in place some requirements as concerns reporting. It is, however, a question how much time one should spend on reporting. But there could be some procedures for how to share and disseminate information and knowledge from abroad within the organisation.	procedures for sharing		
P15-Q12	Do you have any ideas about how to do it?	It can be done in both oral and written forms, but I am in favour of written forms since it provides for documentation. It could be in the form of a note summarising the work done, and this would not take too much time.	oral and written forms of sharing	easy forms of sharing	time available for sharing
P16-Q13	To what extent are objectives defined for your activities?	In the NVF committee, for example, we have objectives for the work that are agreed upon among the committee members. For me, it is important to link these objectives to my work for the road administration. Also when I take part in the research of TESSA in the US, I select only research activities that are most relevant to my work.	goal-orientation		
P16-Q14	How are the outcomes applied in the professional community and in the organisation?	International cooperation is an important part of our work. We have to follow the European CEN standards in the development of national standards to be used, for example, in the handbook on road construction. Our research and development activities and the implementation of new methods and techniques are to a large extent influenced and inspired by what is going on abroad and by our cooperation with other countries. I think we are quite good at using the outcomes of the international activities.	explicit application		
P17-Q15	What about differences in the way people act?	Some members are very reserved in the beginning, but once you get to know them, they become more open and talk about the problems and challenges they face. In the late evenings, they tell you the story.	trust-building		
P17-Q16	What can you do yourself to get more out of your participation?	I should perhaps start taking notes at meetings. I am not good at that. I take part in two-time meetings abroad every year, so I do not spend much time on international work.	trash		

FI 8-Q17	Can you tell me how you use the networks you have developed within the NVF and the WRA?	I send inquiries to people I know from the WRA whenever I need to know something, and I also respond to inquiries quite often. I find that the WRA network works well, but I have much closer contact with people I know from the NVF and other Nordic forums.	use of network			
FI 8-Q18	If you were free to choose an international activity, what would be your choice?	Although the WRA can be quite exciting and exotic, I would prefer Nordic cooperation since we have much in common with other Nordic countries due to the climate and other things. Research projects of NordFOU are particularly relevant.	partners with similar challenges	group discussion over time	co-creation of new knowledge	joint report writing

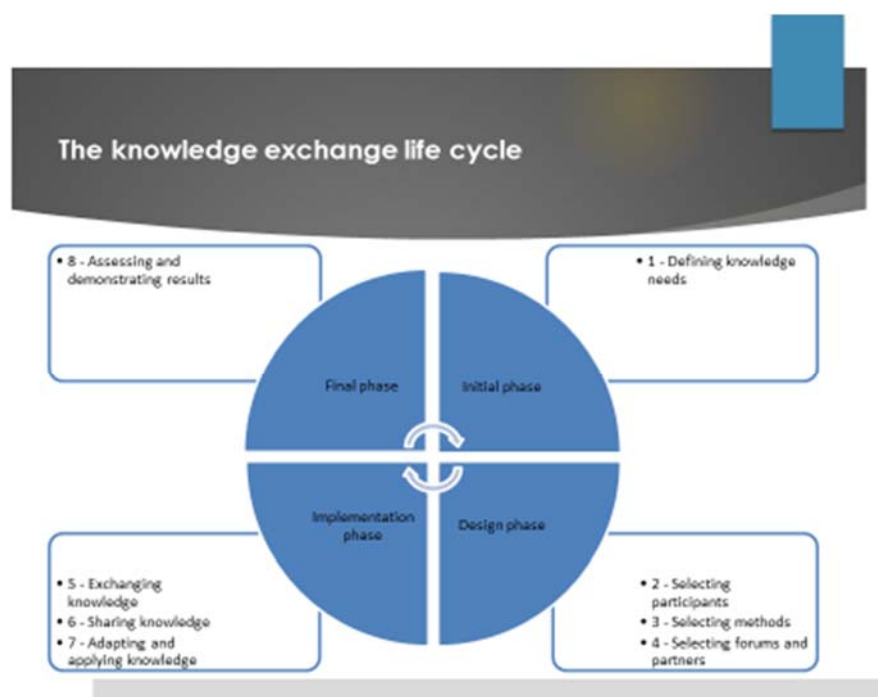
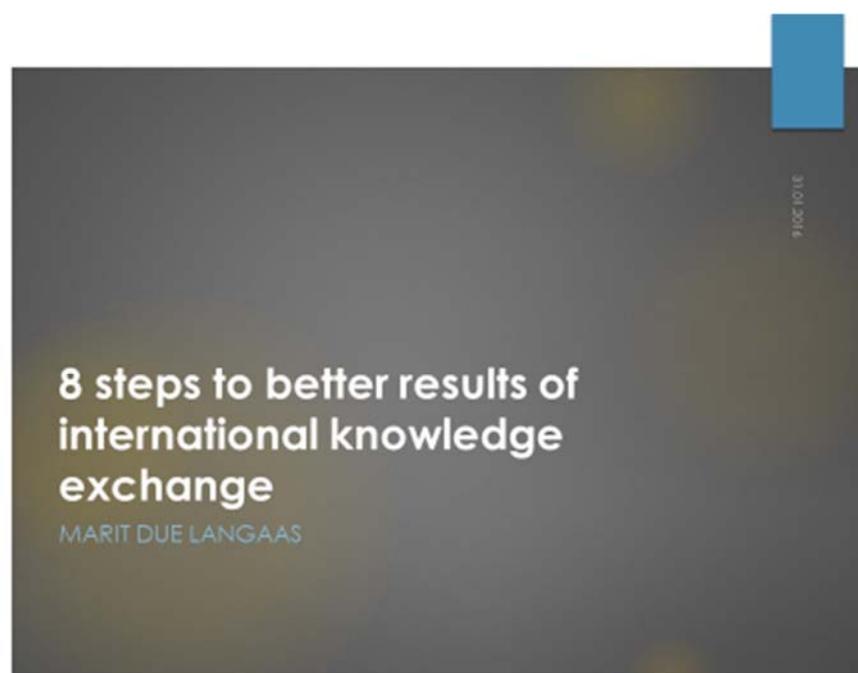
Appendix 7: Grouping of codes into themes

No	Code	Super-code	Theme	Theme description		
1	personal contact	ways of interacting and communicating	preferences for ways of exchanging knowledge	how participants value interaction and communication in exchanges and structuring of exchanges, and various kinds of activities		
1	network-building					
1	use of network					
1	face-to-face interaction					
1	use of ICTs	ways of structuring exchanges				
1	group size					
1	goal-orientation					
1	relevant technical focus					
1	inter-group cooperation	multidirectional activities				
1	group discussion over time					
1	one-time group discussion					
1	exchange of existing knowledge					
1	co-creation of new knowledge					
1	seeing solutions					
1	joint report writing					
1	listening to presentations				unidirectional activities	
1	giving presentations					
1	reading					
2	participants' qualifications					
2	shared experience with colleagues	facilitation of knowledge exchange partaking by the organisation	how participants view ways of organising the partaking in knowledge exchange by the home organisation			
2	teamwork in home organisation					
2	relevance					
2	choice of method/activity					
2	time available for exchanges					
2	travel arrangement					
3	language challenges	interactions in multicultural settings	how participants experience interactions between different cultures and countries			
3	English skills					
3	conditions in home countries					
3	attitudes to time					
3	exchange attitudes					
3	personality					
3	trust-building					
3	no-show at meetings					
3	socio-cultural understanding					
3	partners with similar challenges					
4	informal oral sharing with colleagues			sharing practices	introduction of new knowledge in the organisation	how participants introduce knowledge from abroad in the home organisation and factors that influence the introduction
4	formal oral sharing in various forums					
4	written sharing					
4	distribution of documents					
4	easy forms of sharing	sharing preferences				
4	oral forms of sharing					
4	written forms of sharing					
4	oral and written forms of sharing					
4	time available for sharing	sharing constraints				
4	reluctance to sharing					
4	procedures for sharing					
4	management support for sharing					
4	information management system					
4	adaptation of knowledge					
4	participants' influence					
5	attitudes to knowledge from abroad		the receiving environment	how participants perceive conditions in the organisation for receiving knowledge from abroad		
5	demand for knowledge from abroad					
5	need for knowledge from abroad					
5	integration of knowledge exchange					
5	priority of knowledge exchange					
5	strategies for knowledge exchange					
6	professional growth	individual benefits	benefits of knowledge exchange	how participants perceive benefits for themselves as individuals and for the organisation		
6	professional and personal growth					
6	keeping pace with developments					
6	socio-cultural skills development					
6	English skills development					
6	increased job satisfaction					
6	career development					
6	implicit application	organisational benefits				
6	explicit application					
6	social responsibility					

Appendix 8: Issues of discussion in focus groups and with individuals

- To what extent should participants' preferences for ways of exchanging knowledge guide the selection of knowledge exchange methods and activities?
- How can the organisation better facilitate exchanges?
 - Criteria for selection of participants
 - Participation in international groups and projects with teams rather than with individuals
 - Planning and preparations of conference attendance
 - Time available for exchanges
- What is the biggest constraint in international interaction and communication – the use of English language or cultural differences and lack of socio-cultural understanding?
- What exchanges are most useful – those in Nordic (regional) forums or those in European and global forums?
- What conditions constrain knowledge sharing within the home organisation?
 - Lack of systems and procedures
 - Lack of support from managers and colleagues
 - Lack of motivation
 - Lack of time
- To what extent do participants in exchanges look at themselves as catalysts to initiate improvements in policies and practices that result from foreign knowledge?
- To what extent is the home organisation prepared to receive knowledge from abroad?
 - Attitudes to knowledge from abroad
 - Demand for knowledge from abroad
 - Identification of needs for knowledge from abroad
 - Integration, priority, and strategies of knowledge exchanges
- How to know and show results of exchanges?

Appendix 9: Slide set used for informal presentations



Reactive and proactive needs - examples

A reactive need
Two road projects are selected for piloting a Public Private Partnership (PPP) model. In the PPP model, a PPP company is given the full responsibility for designing, constructing, financing, and operating a road section on behalf of the State for a given period. The road transport administration as the client is responsible for the road planning and for controlling the quality and performance of the road service. This model is new to the organisation, and it decides to go abroad to learn from other countries having experience with PPP projects.
Expected intermediate result: Participants should acquire knowledge on contracting and supervision of PPP projects.
Expected knowledge exchange result: The organisation should be able to contract and supervise PPP projects.
Organisational goal: Be a competent client in road construction projects.
A proactive need
Increased stakeholder influence and media scrutiny makes good governance and anti-corruption measures important. The performance measurement system of the organisation reflects these issues, but still the organisation finds it worthwhile to explore if there is more to learn from other countries.
Expected intermediate result: Participants should identify good practices on good governance and corruption fighting of road transport administrations abroad.
Expected knowledge exchange result: The organisation should become in a better position to make decisions on the performance measurement system with regard to good governance and anti-corruption measures.
Organisational goal: Be a responsible and reliable public authority.

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Connection between defined knowledge needs, progress monitoring, and results assessments

	Definition of knowledge needs	Monitoring of progress	Assessments of intermediate results	Assessments of knowledge exchange results
Specifications	<ul style="list-style-type: none"> Expected intermediate results Expected knowledge exchange results Organisational goal(s) concerned 	<ul style="list-style-type: none"> Monitoring of progress towards achieving expected results Long-term exchange: monitoring of exchange process and integration process Short-term exchange: monitoring of integration process 	<ul style="list-style-type: none"> Achieved intermediate results versus expected intermediate results Unexpected intermediate results 	<ul style="list-style-type: none"> Achieved knowledge exchange results versus expected knowledge exchange results Unexpected knowledge exchange results Contribution of results to achieving organisational goal(s)
By whom	<ul style="list-style-type: none"> Groups of employees and managers concerned 	<ul style="list-style-type: none"> Managers in dialogue with participants 	<ul style="list-style-type: none"> Participants in dialogue with colleagues and managers 	<ul style="list-style-type: none"> Participants in dialogue with colleagues and managers
When	<ul style="list-style-type: none"> Before management's decisions on knowledge exchange initiatives 	<ul style="list-style-type: none"> Continuously during the implementation phase 	<ul style="list-style-type: none"> Upon completion of exchanges 	<ul style="list-style-type: none"> Upon completion of the implementation phase
Documentation	<ul style="list-style-type: none"> Decisions 	<ul style="list-style-type: none"> Regular progress reports 	<ul style="list-style-type: none"> Participants' written accounts and reflections 	<ul style="list-style-type: none"> Participants' written accounts and reflections

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Participant selection criteria

- Professional qualifications and work experience that match the defined knowledge needs
- A good command of the English language, the organisation should provide for English language training if needed.
- Position and responsibilities that foster introduction of new knowledge in the organisation
- Catalytic skills and ability to initiate, influence, and drive developments and changes in the organisation
- Time available to take part in exchanges throughout the process

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Suitability of knowledge exchange methods

Long-term methods

- **Committees, working groups, and cooperation projects:** These methods facilitate exchange of both tacit and explicit knowledge through in-depth, face-to-face and virtual exchanges among peers, continuous learning, and network-building. While all long-term methods are suited for exchanging knowledge and learning about new methods, technologies, and practices, cooperation projects are particularly suited for co-creation of new knowledge.
- **Staff exchanges:** Staff exchanges also allow for exchange of tacit and explicit knowledge through in-depth, face-to-face exchanges among peers, continuous learning, and network-building. Staff exchanges are usually long-lasting, and require more resources compared with other methods.

Short-term methods

- **Study tours:** Study tours allow for a high level of interaction among participants and exposure to the topic of study, and an opportunity to see how things work in practice. Study tours can be appropriate if, for instance, there is a need to know how to manage a new method. Although study tours usually last for a few days, high level of interaction facilitates exchange of tacit knowledge.
- **Conferences:** Conferences and that alike are suited to get a state-of-the-art overview and to learn what knowledge exists and about new concepts. Usually they do not provide for in-depth learning, and mostly explicit knowledge is exchanged. The level of interaction, however, depends on the size of the event and the use of social media (Twitter) during the events. There is usually more interaction at small seminars and workshops than at large conferences.

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Appendix 10: Paper for presentation at the 95th Annual Meeting of the Transportation Research Board

A model for effective international knowledge exchange

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